

# **The American Journal of Pharmaceutical .... Education ....**

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**THE OFFICIAL PUBLICATION OF THE AMERICAN  
ASSOCIATION OF COLLEGES OF PHARMACY.**

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**Objectives for which pharmacy should work: Maintaining pharmaceutical education at a high level, providing adequate financial support for schools of pharmacy, giving the public adequate protection through revision of pharmacy laws, establishing a better working arrangement between pharmacist and physician, and creating more unity within the profession.—Robert L. Swain.**

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**Volume V**

**January, 1941**

**Number 1**

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# THE AMERICAN JOURNAL

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## PHARMACEUTICAL EDUCATION

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### **Program of the Pharmacy Section of the American Association for the Advancement of Science**

The next meeting of the Association will be held in Dallas, Texas in June. Scientific workers in the pharmaceutical sciences are urged to submit titles at an early date to the Chairman of the Committee on Program. While the American Association for the Advancement of Science publishes in Science only the abstracts of the papers presented in its various sectional meetings, all authors presenting papers worthy of publication can be assured that their papers will appear in some standard scientific journal. A number of papers given at the Philadelphia meeting have already been accepted by Pharmaceutical Archives. Titles for the Dallas meeting should be sent to Dr. Glenn L. Jenkins, University of Minnesota, at Minneapolis.—Editor.

### **BOOK AND JOURNAL EXCHANGE**

The Connecticut College of Pharmacy would like to secure the following journals: Journal of Industrial and Engineering Chemistry; Volumes 19, 20, 23, 26, 27, and 31; Proceedings of the American Conference of Pharmaceutical Faculties, first and second meetings 1900 and 1901; Proceedings of the American Pharmaceutical Association, Volumes 1 through 16- 18 through 23- 33 and 37; Journal of the American Pharmaceutical Association Volumes 1 through 3, 7 through 19, 24 and 25, 27 and 29.

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## Pharmacy and Social Security in Chile\*

ORLANDO CATTANI

Board of Compulsory Security, Santiago, Chile, S. A.

Throughout many years in Chile, man asked protection for his only capital which was work. His petitions, together with the development of social criteria were the first steps in the preparation of the ground for the establishment of social security laws. This was possible only when the state understood the importance of its social function and envisioned the results that could be obtained. These factors grew and on September 8, 1924, a law, number 4054, was passed which created the Board of Compulsory Security. This law provides for sickness, disability and old age insurance, for all workers in the country, both men and women, whether they are natives or foreigners.

In order to be entitled to these benefits granted by the law, the insured persons have to be registered and pay 2 per cent of their salary. This amount is subtracted from the worker's salary on each pay day by the employer. This percentage is augmented by 1 per cent by the Board in the nitrate and mining zone.

The general organization of this institution briefly is as follows: a central organization or general administration, serving all parts of the country. The general administration, in turn, is composed of technical administrative departments required for the management of the institution. Among these are general accounting, fiscal duties, and direction of medical service. I have mentioned especially the direction of medi-

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\*Dr. Cattani who is an official of the Social Security Board in Chile has just completed a four months' stay in the United States making a study of pharmaceutical education and practice. This article describing the system of medical and pharmaceutical service in Chile was written for this Journal at the request of the Editor. It is of special interest because of the present trends in this country toward the extension of a better medical service to all the people. We are grateful to Dr. Cattani for showing us how a sister republic in South America is attacking this same problem effectively. We are also grateful to Dr. H. S. Saenz of the department of modern languages of the University of Nebraska who translated this article from the Spanish. Read Dr. Cattani's letter mailed from the Canal Zone as he was homeward bound, Gleanings from the Editor's Mail.

cal service because it administers the numerous services given to the insured over the entire country.

The Board of Compulsory Security is administered by the General Council, presided over by the Minister of Health representing the government and integrated by three representatives of the employers, three representatives of the workers, and one of the medical body. They all act as advisers with the right to voice their opinions and to vote. To this Council belongs, by his own right, the General Administrator of the institution, who is appointed by this same Council.

Compulsory security effects some 1,250,000 people. In this number are included the insured, their wives, and children who are also attended by the institution.

It was said in the beginning of this article that this insurance was for sickness, disability, and old age. In regard to disability, when one who is insured has a disease which incapacitates him for work, and his condition must be checked by the doctors of the organization, he receives a life benefit, if the disability is permanent. If it is temporal, he receives it for the time of his disability. The number of benefits granted in the year 1934-1935 was 634; in 1935-36, 576; in 1936-37, 594; and in 1937-38, 626. The amount of the benefit is calculated according to the salaries earned by the insured.

For the assistance of the sick, the Board of Compulsory Security has its own medical services scattered all over the country, and these are called medical clinics, or "poli-clinics." In the cities or towns in which circumstances require it, these clinics have a small hospital adjacent to them. When this is the case, they are called "Casa de Socorro" (emergency hospitals). This type of service is not found in all the cities because of the fact that the organization uses the beds of the hospitals of Public Beneficence. With such hospitals it has a special contract. For the assistance of the insured in places of a small population in the rural districts, the institution has "Postas" (or traveling dispensaries) and Rural Medical Stations. There are small establishments, visited once or twice a week by the doctor. They have an auxiliary personnel in residence, an intern or a nurse according to the need. The number of services maintained by the Board of Compulsory Security is as follows: 146 Medical Clinics; 30 "Casas de Socorro" (or emergency hospitals); 360 "Postas;" and 152 Rural Medical Stations. Besides this, there is one emergency

hospital in the city of Santiago and two sanitoriums for tuberculosis, both in the cordillera zone. It must be made clear that all the figures given are as per June 30, 1938, for at this time we do not have access to the last two briefs of the institution. In the preceding figures, we have not included the numerous services rendered by the Public Beneficence, private institutions, and others.

In all the services, the following personnel was available on the 30th of June, 1938; 711 doctors; 113 dentists; 90 druggists; 173 matrons or nurses; 60 welfare workers; and 700 functionaries belonging to the technical and auxiliary personnel, such as, interns, pharmacy assistants, and nurses.

The medical assistance that the Board of Compulsory Security gives to the insured is complete and free of charge. It includes the medical examination, treatment, electro-medical therapeutical applications, clinical analysis, hospitalization and permission to use orthopedic apparatus. When the sick person cannot come to the Medical Clinic, he receives medical attention at home.

The attention should be called to the work by some sections such as the Mother and Child Section, which has charge of the prospective mother from her first period until birth, and it continues to serve the newly born until he is two years of age. The mothers are required to take their children each week to the Medical Clinic even if they are in good health in order to check the weight and general health. By so doing, the doctor can modify the feeding of the infant properly and if necessary, prescribes medical treatment. The pregnant woman receives six weeks of monetary help before birth and six weeks after birth which frees her from having to work in such a critical period of her life. The subsidy is 50 per cent of her salary. The first two weeks and the last two weeks are paid by the employer according to the Working Code and the other four weeks before the birth and the four after the birth are paid directly by the Board of Compulsory Security. For the child, the insurance affords dry milk and necessary medicines. In addition, the mother receives a subsidy in money equivalent to 10 per cent of her weekly salary until the child is one year old. The Board also teaches the mother to make the clothes for the child and to dress it, and to prepare the different foods that the child needs as it grows.



In order to understand better the extent of the work done for the mother and child, we give the statistical figures for the year July 1937 to June 1938: assistance was given to 38,810 children; this represents 107,891 consultations for healthy children and 62,506 consultations for sick children. In regard to the mother, in 11 months of the same period, 9,759 infants were delivered in the respective homes of the patients, and 7,542 were delivered in the maternity wards of the hospitals.

The section of Sanitary Education is in charge of the spreading of information about elementary sanitary measures by lectures given in the ward cases, syndicates, or in the factories. These talks are accompanied by instructive moving pictures or diagrams or slides related to the topic. To them is added almost always a musical literary number in which the workers artistic groups take part. In order to spread information about venereal diseases, forms of contagion, consequences, and the manner of attack under the medical control, and the prophylactic measures necessary to avoid the spreading, are shown.

It would be a long task to describe completely the work done by the Board of Compulsory Security in Chile. For this reason we shall limit ourselves to reviewing briefly the function performed by pharmacy and the pharmacist in this organization. All the pharmaceutical service forms the Section of Pharmacy which is composed of a central organization in charge of which there are three pharmacists who direct technically and administratively, the entire service. They have charge of the warehouses for the providing of the service all over the country, of a laboratory which prepares the pharmaceutical specialties proper, and of the distributing services. These distributing services are grouped in three main divisions, pharmacists' clinics, medicine chests for rural services. The pharmacists correspond to classical lines imposed by the proper modalities of the services that we shall see later on. The clinic medicine chests are small institutions in which nothing is prepared. They are limited to the delivery of pharmaceutical specialties or the patent medicines which are sent to the chests by the nearest pharmacy of the insured. The formulas of the prescriptions in services of this nature are prepared in the commercial pharmacies of the locality. Pharmacy assistants are in charge of these medicine chests. They

are persons who do not have a university title but are authorized by the sanitary authorities to exercise these functions. This permission is granted under certain special conditions, among which is required an examination of competence. Finally, the rural medicine chests are identical to the preceding, but they are smaller, and the principal difference consists in the fact that they do not have permanent technical personnel. The personnel of pharmaceutical service is of two classes, pharmacists and pharmacy assistants. This does not include porters and helpers whose duties are not technical. On June 30, 1938, there were 90 pharmacists and 60 pharmacy assistants in service. At the same date there were 66 pharmacists and 99 clinic medicine chests. These figures have been increased in the last two years especially in regard to personnel. The preceding figures do not include rural medicine chests.

The work performed by this service can be appreciated easily by considering the number of prescriptions filled amounting to 1,654,334 in the year between July 1, 1937 and June 30, 1938. The number of prescriptions have increased from year to year for two important reasons which are: the greater number of insured and the ever increasing number of services. It is interesting to note that in speaking of prescriptions, we make reference to the formularies and in them there may be two or more prescriptions on one blank. The average per blank is two prescriptions.

We shall call your attention to certain basic norms of the service, some represent technical fundamentals and others are economical. For example, all the druggists in the pharmaceutical specialties used by the Board of Compulsory Security form the pharmaceutical arsenal of the institution, but in this arsenal are not included all the drugs on the market, nor all the normal specialties due to the fact that they are selected according to their quality and effects. In this we follow the principle that it is better to know how to use a substance well with a determined purpose than several that are imperfectly known. On the other hand, the price factors are also considered. The preference being given to the most economical substance providing that the quality of the product does not suffer.

In regard to the pharmaceutical specialties, they are prepared for the most part by the Central Laboratory exclusively

for the Board in the known pharmaceutical forms. In order to prepare a new specialty, it is required that there be enough demand for its consumption and that the pharmaceutical form can be kept, or the technic of extemporaneous preparation be difficult or when it be a question of products for the rural service which is indispensable because of emergency. The clinic medicine chests are maintained for economic and social reasons as we shall see later. These clinics are generally found in towns whose density of population is small and where generally there is only one private pharmacy. We have already said that these services only include pharmaceutical specialties prescribed by the doctors of the service to the insured, and the prescriptions are filled in the private pharmacy. The first part represents the economical reason, since the cost of our specialties is lower than that of the market, and the second is the social reason, for if the Board of Compulsory Security would install pharmacies for the service of the insured in such places, it would take away the clientele of the private pharmacists who would not be able to survive. In this manner the population would receive a serious injury for they would be deprived of pharmaceutical service, since the Board of Compulsory Security cannot sell medicines because of expressed dispositions of the very law that created the Board. The reasons which justify the maintenance of this rural service are the scattered population, great distances between centers of population, and the bad roads, which offer serious difficulties for the lending of these services. As it intends to give a complete assistance even in the most remote places, a serious problem has arisen in such places where there are no private pharmacists and the doctor sees his field of therapeutic drugs limited to the pharmaceutical specialties. In order to eliminate this inconvenience, prescriptions are being standardized and prepared in the nearest pharmacy and sent to the rural services. When the medicine is a potion, it is prepared in a concentrated form to avoid the decomposition caused by the low density resulting from these pharmaceutical forms. Of course, in this case, the dosage must be varied. For instance, instead of taking a tablespoonful, one indicates a teaspoonful of coffee in a half glass of water or some other way. This standardization of formulas is a technical problem that fortunately is already solved with great benefits to the insured mass.

Details pertaining to the administrative organization of the pharmaceutical service could be given, but what has been said gives the general plan and this is the more important.

I thank you sincerely for the opportunity of giving information about our service and also for the attention you have given this article.

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## The Thai Exhibit of Pharmacy\*

ARNO VIEHOEVER

Ministry of Economic Affairs, Department of Science and  
Chulalongkorn University  
Bangkok, Thai (Siam)

As is well known in the countries of the Far East, the Thai people celebrate the advent of instituting their new democratic regime with the annual Constitution Fair. This year, for the first time, the pharmacy unit joined other departments of the University in the work of the Fair. The plan for the exhibit was drawn up with the wise council of the dean, Dr. Toa Labanukrom and the enthusiastic cooperation of Nai Chalor Soloschinda and Nai Arch Kanchanalakchama and other members of the college staff. Special funds, requested by the president of the University, permitted the execution of the plan.

The building of the University unit at the Fair provided an unusually attractive housing for the various college exhibits. It presented a most attractive appearance especially at night with its indirect lighting, both inside and outside, and well deserved the first prize award which it received. The panels bearing large wooden figures, symbolic of the professions they represent, were designed by Nai Chalerm R. That-saniga and executed by students of architecture. They were inspired by Cambodian mythology and when placed against

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\*As is well known, Dr. Viehoever is on leave from the Philadelphia College of Pharmacy and Science and in the employ of the Ministry of Economic Affairs. The American Association of Colleges of Pharmacy is interested in pharmaceutical activities throughout the world. With this in mind, the Editor asked Dr. Viehoever to write about his work in Thai. A letter from the author (Gleanings from the Editor's Mail) should be read in connection with this article.

the main back wall of every exhibit they added greatly to the striking total effect of the displays.

**Model of College.**—On an elevated wooden structure in the center of the exhibit was an impressive and well executed gypsum model of the new College of Pharmacy building now under construction upon the University campus. Below the model was displayed the architect's plans showing the general plan of the building including provisions for intensive training and research.

**Publicity.**—A special bulletin, prepared by the pharmacy staff, and printed in Thai, was distributed free. It set forth the scope of the work of the College of Pharmacy, the purpose of pharmaceutical training, and the need of well trained pharmacists in order to assure the people of Thailand a sufficient supply of medicines. A collection of pharmaceutical journals from all corners of the globe was displayed in order to call attention to the professional activities of pharmacists in other lands. Enlarged photographs showed students engaged in the identification of raw materials, in microscopic study to insure purity of drugs, in chemical and physiological work to show tests for strength and nature of activity and the preparation of medicines in the laboratory on both a small and a large scale.

**Survey of medicinal resources.**—On a long table back of the model was displayed a selection of raw materials which illustrated the wealth of materials native to Thailand. A large map prepared by a skilled artist under the direction of Nai Chalor Soloschinda showed these products in their natural colors in the localities in which they are produced.

**Student work.**—Among the raw materials displayed were the tubers, roots, fruits and seeds which yield an abundance of starch and which the students in the course had identified and then isolated from the pulp and prepared for commercial and medicinal use. Likewise, plant products yielding fixed and volatile oils with drawings of the tissues where they are found were shown. In their spare time the students had isolated the oils and they were exhibited in vials. The medicine and poison exhibit included the domestic strychnos bean which yields strychnine. Also another seed which is strikingly similar but is completely void of physiological action as it contains neither strychnine nor brucine. Among the in-



Staff and Students, (Senior Class 1940), College of Pharmacy, Chulalongkorn University, Bangkok, Thailand. Upper row, left to right, Nai Arch Kanchanalkhanna, Khun Titao Burmag, Dr. Arno Viehoever, Dr. Toa Labanukrom, Nai Klian Burmag, Nai Chalor Soloschinda.



Thai Exhibit of Pharmacy. Left to right: Dr. Arno Viehoever, Nai Arch Kanchanalkhanna, Nai Chalor Soloschinda, Dr. Toa Labanukrom.



secticides shown was the local *Stemona* tuber with the active ingredients isolated for study and training in plant analysis and for the testing of the insecticidal value. Medicinal plants of recognized international importance from all parts of Thailand were planted in front of the wing housing the pharmacy exhibit. The jute plant, *Corchoris capsularis* was among those displayed along with its fiber which is used in gunny rice bags and cordage. Its leaves are a favorite Chinese-Thai food and its seeds contain a heart stimulant of promise. Galenical preparations were prepared by the students. Among them was a much used domestic bitter tonic obtained from *Tinospora*. Ampouls made by the students were shown. This form of medication is popular with Thai physicians.

Alumni work.—Proprietary medicines, cosmetics, tooth paste, perfumes, inks, a dye extract of maklua berries from *Diospyros mollis* G., and sick room supplies, all representing the skilled efforts and accomplishments of pharmaceutically trained Thai business men and manufacturers, were shown.

Demonstrations.—With the untiring assistance of staff members and the student body it was possible to demonstrate (1) Apparatus in operation for the extraction and quantitative determination of the volatile oils from the spices of Thailand; (2) the operation of apparatus devised by the author for the sublimation of active ingredients, such as caffeine, found in many native plants; (3) apparatus devised by the author permitting the projection with varied magnification of living plants and animals in the erect position. This method was developed in the Gross Laboratory for Biological and Biochemical Research in Philadelphia and perfected in the Department of Science of the Ministry of Economic Affairs. In the exhibit we demonstrated how bladderwort catches mosquito larva, a method which gives promise of value in mosquito extermination. *Gobiella*, from the klongs of Dhonburi, being the most nearly transparent vertebrate known, was shown with its internal organs clearly visible. The busy daphnia and the mosquito larvae, greatly magnified, were made visible on large light transmitting screens. This permitted the demonstration of their normal life activity as well as their reactions to changes in environments, such as temperature changes, variations in air supply, the effects of drugs and the action of insecticides. The importance of



such organisms as test animals in determining the strength of medicines and insecticides was made clear to the many thousands of Thailanders who came to see the exhibit.

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## Pharmacy---A Vanishing Profession? \*

EMERSON G. WULLING

There are two major programs to defend health, one preventive, the other curative. Together they are doing remarkable things. And if anything can be done to improve any part of these programs so much the better. To be specific, take the vanishing profession, pharmacy.

The word "pharmacy" is derived from the Greek word "pharmakon", meaning drug or remedy. The profession of pharmacy is concerned with dispensing medicine. Its function is a part of the health program, a vital part. When we take medicine we want to be sure that it is the right medicine, a responsibility of the prescribing physician; and that it is a well prepared medicine, a responsibility of the dispensing pharmacist.

Pharmacy is a specialty whose practice is reserved by law to the pharmacist. A chemist may not dispense. Similarly, a pharmacist should not prescribe. The wisdom of separating the prescribing and dispensing functions is clear when we realize the desirability of a division of labor with the resultant extensive skill possible in each. Furthermore, the division provides a double check on the medicine which we take. Any one may make a mistake, even a specialist, but two specialists are far less likely to err, since each is a check on the other.

Pharmacy is a professional specialty, but its professional integrity seems to be diminishing, as witness the highly commercialized drug store of the comics and gag-men. Certainly, pharmacy has less appeal for public imagination than other health specialties such as surgery, for example.

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\*This paper appeared as one of the leading articles in the December 1940 number of *Hygeia*. The title was used as a legend below a picture of a prescription table on the front cover. The author is a son of Dr. and Mrs. F. J. Wulling of the University of Minnesota. The article is reproduced in the *Journal* at the request of the Editor and with the consent of the author and Dr. Morris Fishbein of the American Medical Association.

No one will say that the proprietor of a restaurant, or of a stationery store, or of a department store is not a useful citizen and perhaps very astute in his field. But no one is willing to have a stationer operate on him or dispense medicine, one drop of which will cure and two, perhaps, kill. The average, modern drug store is a variety store, dealing mostly in commercial items which can be sold over the counter by any one who knows the language and can make change.

Even the most unpharmaceutical of us, if he is old enough, can remember the old apothecary's shop with its bottles of colored liquids in the windows, and inside:

Here phials in nice discipline are set,  
There gallipots are ranged in alphabet.

—Garth's Dispensary.

Mystery and glamour hovered about such a shop. The apothecary himself was a man of parts, a man with lore of magic, it seemed. These shops have vanished. In their places we have drug stores, the kind that we joke about.

The apothecary's shop has indeed vanished. Need the casual observer be blamed if he thinks the profession has also vanished? With so much evidence of professional men turning into merchants, with not even the merchants' occasional distaste for poaching in another's preserves, it is hard to correct an impression only circumstantially warranted.

In spite of appearances, however, pharmacy is not a vanishing profession. It is a profession in the process of division. And pharmacy, the real thing, is advancing at a thoroughly satisfactory pace and serving its important part in the health program.

A few decades ago a pharmacist practiced a profession, personally, in public sight. He gave a professional service and only that. He was respected by the community as a man who knew something difficult to know, worth knowing. Then two things gradually came about which worked to the disadvantage of the profession: (1) an influx of too many pharmacists; (2) large scale manufacture of medicines. Both came about naturally enough.

There is only a limited amount of dispensing to be done. The state did not limit the number of pharmacists, and the pharmaceutical organizations failed to get it done. A hundred and fifty thousand persons doing the work that could be done by fifty thousand means trouble. The result was poaching.

First more and more patent medicines; then beverages; then merchandise; then anything under the sun except plumbing. That may be next.

Thus we have the spectacle of a wise profession being overcrowded while the professional organizations stood by.

The second disintegrating force was large scale manufacture of medicine. Some medicines, much needed, could be more economically made in bulk than by individual pharmacists. Balms and salves, pastes, solutions, tonics, palliatives, certain simples, and so on, not subject to rapid deterioration, quite clearly can be produced more cheaply in large quantities. As a result large manufacturing firms arose with "lines" of pharmaceuticals. It is important to remember that the advantage was, and is, mostly economic, but this is not always true.

With more pharmacists and less pharmaceutical work, the profession turned to other "lines". A drug store became a variety store.

But is the public innocent of any fault? The old apothecary's shop had a reputation for high quality. If, for example, you had a choice of buying spice from an apothecary or from a grocer, you would prefer the apothecary. The public had confidence in the offerings of the apothecaries. When they offered alarm clocks, the public went in and bought. But why? Would not a clock man be a better judge of value in a clock than a pharmacist who probably does not know the difference between a hairspring and an escapement?

And is the watchmaker, the grocer, the restaurateur innocent of any fault? Why do they let the pharmacists poach in their preserves? They have tried to chase him out, but with no success. The state does not offer them protection as it does the pharmacist. Any one may sell washing machines, even a pharmacist. But not every one can fill prescriptions.

The apothecary's shop is supplanted by the commercialized drug store. The drug store sells anything, even drugs. This condition is rationalized by saying that it is useful to have a drug store in every neighborhood and small village so that sickness can be served promptly. Not every neighborhood, however, can support a drug store tending to its own business only. If a line of notions can be added in addition to the prescription counter, then enough profits will be forthcoming to support the prescription counter. Otherwise you might

have to go a mile or 5 or 50 to have your prescription filled. Specious reasoning! What is distance in this age of quick transportation? And what sort of a prescription can you get filled if the pharmacist has four raspberry sundaes and a bathing cap to sell first? The chain stores answer that question with great glee by saying that in every one of their stores they have a registered pharmacist (required by law, anyway) who does nothing but fill prescriptions at a fixed salary. Think of it: in a drug store, a man who fills prescriptions. The truth is that as often as not the prescription is sent to a central store and filled there. The chain-store men go further. In great self-righteousness they point out that all their "men" are well treated and that the pharmacist is at least an assistant manager. Shades of Galen! What a height to reach; a pharmacist in a drug store to be assistant manager to a man who, as likely as not, does not know what the *Pharmacopœia* is, let alone how to spell the word.

That is one side of the picture, the gloomy side. This condition of chaos is what the public sees. Consequently, pharmacy has been labeled the vanishing profession. Perhaps the pharmacists had it coming to them.

Pharmacy, however, is not a vanishing profession. It is a growing profession. It is in the process of division. The hundred thousand or so pharmacists too many, and the large scale manufacture of medicine, not really necessary, are in the process of being side tracked. In time drug stores will sell packaged goods, and the profession of pharmacy will entrench itself in laboratories and pharmaceutical shops.

Already the movement is clear. Many pharmacists have opened shops where they do nothing but fill prescriptions and carry on pharmaceutical researches. But these are small shops; often they are upstairs in medical arts buildings. The public does not yet generally know that they exist. They not only exist; they flourish. And more hospitals are beginning to have their pharmaceutical laboratories where work of scientific and professional quality is assured. The universities are awakening; they have begun to consider quality rather than quantity. Pharmaceutical instruction has left the haphazard hands of preceptors and the incompetent hands of quiz-schools and is being centered in the scientific faculties of the universities. No longer can a pharmacist be trained in a few months. It now takes four years for a

decent minimum course, and in time the requirements will be even higher. There is ample opportunity for graduate study, and many of the real pharmacists are Doctors of Pharmacy and Medical Doctors. During the past half century pharmaceutical research has kept pace with advancing science, and has contributed much to its advance. The United States Pharmacopœia and the National Formulary have been revised and improved by pharmacists, physicians and others. The profession will emerge eventually in the white-jacketed splendor already achieved by chemistry. After all, pharmacy is the cradle of chemistry, and one of the chief medical specialties.

There are more high caliber men in pharmacy, today, than when the apothecary's shop existed, but they are not as noticeable because they are in the laboratories of hospitals, on the production and research staffs of the reputable manufacturing houses, in laboratories of their own associated with medical centers, and on teaching staffs.

The public may be confident that they exist and that they serve. Let the modern drug store run its course, commercially serviceable it is admitted. But let the public know that the vanishing apothecary's shop does not mean a vanishing profession of pharmacy. Here indeed, is a profession that is growing in health service.

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## Some Applications of Physics in Pharmacy\*

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It is not the intention here to discuss general and cultural reasons that justify the inclusion of some kind of a course in physics in the curriculum of a school of pharmacy. The main purpose is to mention some specific phases of physics that are actually applied in professional and commercial pharmacy.

The druggist is constantly converting from one system of units to another. To appreciate the frequency of this activity, one needs to realize only that official pharmaceutical

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books utilize the metric system, physicians usually prescribe in the apothecary system and drugs are bought from the manufacturer in the avoirdupois system. While the physics course is not burdened with the whole problem of teaching weights and measures (much of this is done in courses in pharmacy), nevertheless, it is generally conceded that the physics course serves to emphasize the practicality of the metric system, and gives the students valuable and extensive practice in solving problems involving conversions of units.

This ability to manipulate units often enables the pharmacist to perform for physicians and patients the important service of evaluating and comparing similar products of various manufacturers. The field of vitamin preparations is an excellent example. Numerous vitamin B<sub>1</sub> preparations are on the market, the vitamin contents of which may be expressed in Sherman-Case units, or in International units, or in milligrams or micrograms of thiamin chloride. The pharmacist should be able to express these preparations all in terms of the same unit, and advise the physician of the results. This often enables the patient to secure much more medication for his money.

The pharmacist has definite need for working knowledge of specific gravity. In the first place, specific gravities of all liquid substances and of many solids are given in the United States Pharmacopœia as criterions for identity and state of purity; naturally, this involves various methods suitable for determining specific gravities of different types of substances. Second, specific gravity is important in the prescription laboratory since physicians often prescribe medicaments in terms of percentage solutions; where percentage solutions by weight are intended, the pharmacist must be able to work with the specific gravities of liquid ingredients and solvents. Finally, rough calculations involving specific gravities are often necessary in the determination of selling prices, since many liquids are bought by weight but dispensed by volume.

Occasionally a little physics will serve as a handy tool in the art of compounding. For example, consider the prescription,

Pepsin drams ss  
Potassium Bromide three VI  
Tr. Belladonna fdrams ss  
Aq. Menthae Piperitae q.s. ad fdrams IV



The writer found it expedient to add the pepsin and potassium bromide to part of the peppermint water, then shake vigorously for a minute or so until solution is effected. This produces considerable foam which requires a long time to subside. If, however, the tincture of belladonna (which contains 70 per cent alcohol and therefore has a small surface tension) is added slowly to the foamy liquid, the foam immediately disappears, after which the prescription may be brought up to volume with peppermint water. In many similar cases, where a liquid of small surface tension is not included in the prescription, a few drops of alcohol dropped judiciously at separate places on the foamy surface will usually suffice to dissipate the foam. As part of the art of compounding, such unobjectionable additions constitute part of the prerogative of the compounder.

Under each official substance the U. S. P. describes a precise chemical method for purposes of assay. However, for quick identification and as reliable criterions of purity, the pharmacist often relies upon specific physical properties. Thus, the U. S. P. lists, for nearly pure chemicals, such properties as melting points, congealing points, specific gravities and solubilities in various solvents. Laboratory practice in the technics of determining these physical properties is usually relegated to courses in chemistry and pharmacy.

Various other specific physical properties are occasionally utilized for purpose of identification and determination of purity. These physical methods are especially valuable in the case of naturally occurring mixtures, such as volatile oils, the composition of which is often so complex as to make chemical methods of analysis most difficult, and in the case of complex organic medicaments which are either expensive or none too stable. Thus the U. S. P. X listed refractive index ranges for 23 official substances: for example, oil of clove for medicinal purposes must possess a refractive index of from 1.5300 to 1.5350. Since pharmaceutical products present a wide range of refractive indices, the Abbe and Zeiss immersion refractometers are commonly employed.

The importance of optical activity is evident from the fact that the U. S. P. partially defined 42 official substances in terms of their capability of rotating the plane of vibration of polarized light. For example, hyoscine hydrobromide (a hypnotic) is described as providing a specific rotation of not less



than  $-22^{\circ}$  and not more than  $-22.75^{\circ}$ , using sodium light under carefully stipulated conditions.

Fluorescence has its applications. Many substances, notably certain alkaloids, must fluoresce properly under certain prescribed treatment. Properly used, fluorescence serves to detect petroleum products in fats and oils, to measure deterioration in complex organic medicaments and often to trace chemical changes during process of manufacture.

Colorimetric methods of analysis have been employed for some time, and, as medicaments gradually increase in chemical complexity, should become still more popular. The U. S. P. provides colorimetric standards for cod-liver oil, also for use in carbonization tests with sulfuric acid on a number of organic compounds. The use of such standards also permits exact duplication of the color in intentionally colored preparations. Even turbidimetric methods of analysis have been employed, and the more precise pieces of apparatus for them involve direct applications of photoelectric cells. Gasometric methods of analysis are frequently employed; for example, the U. S. P. X method of assaying sweet spirit of nitre utilized the liberation of nitric oxide, which occurs when the spirit is treated with potassium iodide and sulfuric acid. Such methods, in addition to demanding a knowledge of the technic of gas manipulation, utilize calculations involving the gas laws.

Various electrolytic phenomena are of importance to the student of pharmacy. He is expected to know the source and general method of manufacture of the materials he uses; and many important medicaments are made electrolytically, for example, caustic soda, caustic potash, chlorine, potassium chlorate, sodium hypochlorite solutions and chloroform. The Pharmacopœia also describes methods for the electrolytic determination of copper, mercury, silver and zinc compounds; in the U. S. P. X, specific directions were given for the electroanalysis of 19 individual substances. Again, students must have a fair grasp of hydrogen ion concentration and its expression in terms of pH. For reasons of stability and therapeutic activity, some preparations must be adjusted to pH's within certain stipulated ranges. It is customary to familiarize the students with both the colorimetric and potentiometric methods.

It is not implied that the foregoing applications of elec-

trolysis are to be presented in the physics course. The applications are actually encountered later on in courses in pharmacy and chemistry. From his physics it is expected the student will recall only the fundamentals—how an electrolyte functions to complete an electric circuit; how electrons are involved in chemical changes; the operation of a potentiometer; how a cell may be set up so that its electromotive force will be a function of the hydrogen ion concentration of the solution surrounding its electrodes; *etc.*

Petrolatum Liquidum (mineral oil) in both its heavy and its light forms is described as meeting certain viscosity specifications. Humidity measurements and humidity control are also of considerable importance in pharmaceutical manufacturing, since many substances are hygroscopic, while others, such as effervescent salts, deteriorate in the presence of moisture. The packaging of such materials so that they reach the consumer in proper condition is a continual problem. Decomposition on exposure to light causes difficulties too, hence a knowledge of light filters can be utilized to design containers that limit the transmission of the damaging parts of the spectrum.

Simple experiments in spectroscopy are deemed desirable, since the student hears much about emission spectra in his courses in inorganic chemistry, and many references to absorption spectra are encountered in biochemistry, pharmacology and physiology. Emission spectra for identification purposes and for the detection of small amounts of metallic impurities have long been used in pharmacy. With the increasing complexity of organic medicaments, absorption spectra methods probably will become more numerous. They have already been strongly recommended by various workers for the convenient and rapid evaluation of vitamin preparations. For example, the potency of vitamin A preparations is easily determined spectrophotometrically by measuring the intensity of absorption of light of wave-length 3280A; the method is rapid, agrees well with methods based on animal experimentation, and is applicable with acceptable accuracy both to concentrates containing high percentages of vitamin A and to natural products containing a small fraction of 1 per cent of vitamin A. Absorption spectra methods for some other vitamins are also available and show promise of great usefulness.

Up to this point, the professional side of pharmacy has been considered. Concerning the commercial side, only a few of many possible applications will be mentioned.

If one were seeking a thermos bottle, but knew nothing of its operation, he obviously would be impressed if the salesman were able to explain the structural features of the instrument designed to minimize energy transference in either direction by conduction, convection and radiation.

Cameras and photographic supplies offer an excellent opportunity to apply one's knowledge of optics. There is the question of the kind of an instrument a particular customer should purchase, which involves consideration of the relative merits of different types in terms of structural features. After a purchase, questions arise as to how to get the best results with the camera and to make it applicable for different purposes under various conditions. True, literature on the subject is available, but the superiority of oral instruction and demonstration is obvious. The type of film to be employed, adjustment for varying object distances, relative aperture, time exposures, and many other points need discussion. The customer usually returns for another course in instruction when he wants to take indoor pictures, do his own developing and printing, start taking moving pictures, and, always, when he gets into difficulties which lead to poor results. The analysis of his difficulties is an important (and usually easy) part of the salesman's job. Judicious use of the lens equation or a comparison of the *modus operandi* of the eye with that of the camera may often be made to serve very advantageously for this purpose.

In the early days of radio, many sets reached the consumer through drug channels. To a lesser extent this is still true, especially in small towns and communities where the clientele often turns to a druggist for a particular type of service not offered elsewhere. Even though the elaborate testing devices employed today in radio service tend to render the work empirical, nevertheless, it is my understanding that the elementary principles of radio and electricity are often applied.

An elementary knowledge of radiation is almost indispensable in the intelligent sale of a therapeutic lamp. As for electric clocks, I once saw a salesman sell one by making a

rough drawing to show how it operated. (I think it was really the drawing the customer bought.) Many of us know how a well-known pharmaceutical house has made the general public "*surface-tension-conscious*" through extensive advertising of this physical property in relation to the germicidal activity of aqueous solutions; in fact, the preparation concerned was baptized S. T. 37 because its coefficient of surface tension is 37 dyne/cm. One could go on for some time elaborating on other specific topics that afford the pharmacist definite opportunities to use his knowledge of physics in the commercial side of his business.

Displays of physical apparatus or processes can often be used to advantage in the store. They do not have to be elaborate; in fact, usually the simpler they are, the better they work. As a single example, a druggist once displayed a series of old x-ray plates and films. When the news got out, many people came expressly to see the display. A film showing an open safety pin lodged in a child's stomach created the most interest. The number and variety of such displays, as we all know, is practically unlimited, and the general interest in them is beyond question.

It has been my experience and observation that there is yet another important side to the story of the place of physics in the training of a pharmacist. The neighborhood druggist is the closest approach to a scientific man readily available to all members of the community. Think this over with regard to your own community, and I am sure you will find it so. This means that scientific news of the day is very often discussed in the store, and it affords the druggist a rare opportunity to build good will and a valued prestige. Recent submarine disasters provide a case to point,—I do not remember how many times I was privileged to explain the method of calculating pressures beneath fluid surfaces. The close approach of Mars was another example; during dull hours it was a frequent topic of conversation. When helium makes the first page, one can be nearly certain that someone will bring up the relative advantages and disadvantages of it and hydrogen for lifting purposes. The importance of situations such as these is, I suppose, questionable; certainly their quantitative effects as builders of prestige and good will are difficult to measure. Judging from my own experience, how-

ever, I am inclined to believe that they can be extremely valuable, and alone, would perhaps justify the inclusion of physics in the curriculum of a school of pharmacy.

No attempt at an exhaustive treatment of this subject has been made. A series of examples has been presented in an effort to show that the pharmacist has a definite need for certain phases of elementary physics in the daily practice of his own chosen profession.

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## The Value of Analytical Chemistry to the Pharmacist\*

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Chapter four of the history of chemistry embraces the Modern Period, which is subdivided into the Qualitative and the Quantitative Periods. They are collectively referred to as the Era of Analytical Chemistry. The achievements of Paracelsus, Galen, and other iatro-chemists were destined to be short-lived because the ideas of iatrochemistry bore the germ of their own undoing. The scientists of this era were insufficiently grounded to conduct studies in medicine and biochemistry, though we now realize that their work was not in vain. In the early years of the eighteenth century, chemical investigation of qualitative nature was stimulated by Stahl's phlogistic theory of combustion. Stahl's contemporaries comprise a host of immortal men whose qualitative works in both chemistry and physics are well known by all students of science. One of the phlogistonists, Lavoisier, is credited with being the father of quantitative chemistry because of the fact that he employed the balance as a tool in his experiments. Scheele, Priestley, Cavendish, and Bergman died staunch phlogistonists, but the theory was overthrown in the early nineteenth century when Lavoisier finally deserted the ranks of his earlier associates. Evidence of quantitative investigations being well under way was offered by the development of the ice calorimeter by Lavoisier and Laplace, Dalton's atomic

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\*Read before the Conference of Teachers of Chemistry at the 1940 meeting at Richmond.

theory, Avogadro's hypothesis concerning the numbers of particles of gases in given volumes, and Davy's experiments in electrolysis resulting in the discovery of the alkali and alkaline earth metals. It was not long before Berzelius seriously challenged Lavoisier's title as father of quantitative chemistry. The development and diversification of analytical chemistry through the years up to the present date are far too comprehensive to be outlined in a brief report. Nevertheless, the benefits derived from the application of that chemistry in the courses which constitute part of the pharmacy curriculum are well worth consideration.

An interpretation of the term, analytical chemistry, cannot be limited to definitions of qualitative and quantitative analysis of purely chemical interest. It is true that qualitative analysis is that branch of chemistry treating with the composition of matter and the identification of the elements and groups of elements of which matter is composed. Likewise is it true that quantitative analysis is the determination of the quantity or amount of each element or groups of elements present in a compound or a mixture. The value of these two types of analyses is not at all as limited as it may appear to the casual observer. Since science consists not of a compilation of facts, but of generalizations based on these facts, it is apparent that the application of the fundamental principles of qualitative and quantitative analyses results in a host of specialized fields of study. Thus, the studies in plant chemistry, food chemistry, physiological chemistry, pharmaceutical assaying, incompatibilities, etc., are nothing more than adaptations of qualitative and quantitative processes which are made with a definite view in mind. These and many others fall into the general category of analytical chemistry.

Since the modern pharmacy student devotes many hours to the study of analytical chemistry, both pure and applied, he is entitled to ask, *What benefits do I derive from these courses?* Success in carrying out analytical procedures is vitally dependent upon technique and upon the ability of the operator to follow directions explicitly. Technique in measuring and weighing properly and in filtering lays the foundation for accuracy in compounding and economy in dispensing. As a public health servant, the pharmacist must appreciate the value of cleanliness of glassware and neatness in manipulation.



More pharmacists would be inclined to work behind open or semi-open prescription counters if they were more tidy in their practices. Courses in prescription compounding are intended, in part, to teach the prospective pharmacist the correct method or methods of mixing the ingredients of a given prescription. Deviation from the proper course frequently results in prescriptions which are unfit for human consumption.

Incompatibilities are frequently the results of chemical reactions. A pharmacist who has at his command a sound knowledge of pure and applied analytical chemistry is one who can predict incompatibilities in prescriptions, even though he may not have had special training in a course of that type. The writer knows of several pharmacists who attempted to compound prescriptions calling for elixir of gold tribromide and codeine sulfate. Their waste of material proved costly. It is not unusual for the pharmacist to be called upon in emergencies to produce an antidote in the event of poisoning. His choice of treatment, pending the arrival of the physician, may well be governed by his knowledge of the reactivity of chemicals, or in other words, qualitative chemistry. The attending physician will regard highly and recommend strongly the pharmacist who is mentally alert.

Analytical chemistry has much cash value. It enables the pharmacist to make a wise choice between chemicals of different qualities. He is taught to interpret the Pharmacopœial monographs to his greatest advantage. Herein is emphasized the identity, the quality, and the stability and proper storage of the raw materials he purchases. He receives practice in preparing standard solutions, test solutions, and stains recognized in the Pharmacopœia and National Formulary. The sales of these solutions are lucrative indeed. The ever increasingly important question of hydrogen ion concentration is well explained in analytical chemical studies, thus enabling the pharmacist to confer intelligently with the physician when the therapeutic value of pharmaceutical preparations is dependent upon hydrogen ion concentration.

Knowledge of analytical chemistry of a physiological nature is of tremendous value to the pharmacist. The rural physician cannot turn to commercial laboratories for his urinalyses and blood tests, and the urban physician will not care to patronize



these laboratories if and when he learns that his pharmacist is willing and qualified to carry out the tests. The layman as well as the physician is conscious of vitamins and hormones. To be able to speak intelligently to both men concerning these products is a distinct advantage evidenced by not only increased sales, but also by economical purchases.

It is needless to point out the value of analytical chemistry to the pharmacist who plans to enter into the industrial type of work, or into the Civil Service. The number of pharmacists who choose to engage in graduate study increases annually, and to them knowledge of pure and applied analytical chemistry is an absolute necessity. However, why go to that extreme? Frequently, medical students prefer a modified pharmacy curriculum to the conventional pre-medical course simply because of the fact that in making the choice their training in the various fields of analytical chemistry is far more intensive.

Too frequently is the pharmacist regarded a specialist. He is a potential expert whose success depends upon willingness to apply himself. Trade schools graduate innumerable specialists, but professional schools develop potential experts. To be sure, much of the training of the pharmacist concerns specific fields, e. g., prescription compounding, alkaloidal chemistry, etc., nevertheless the blending of these fields produces a most valuable way for him to become an expert. Specialization is frequently regarded the keynote to success, but it must be remembered that the specialist serves occasionally while the expert serves constantly. The pharmacist can and will serve constantly when he convinces his patrons and his prescribing physicians of his expertness.

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## A Practical Way of Teaching Pharmaceutical Mathematics\*

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The difficulty of properly presenting a course in pharmaceutical mathematics, and the question of its appropriate

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\*Read before the Conference of Teachers of Chemistry at the 1940 meeting at Richmond.

position in the curriculum have long been topics of much discussion. Some schools of pharmacy place the course in the freshman year, others in the sophomore or junior year, and a few offer it in the senior year. In each of these cases, however, mathematics has been poorly taught, if the failure in this phase of the work by candidates for registration before the boards of pharmacy is any index of our teaching efficiency. These failures should provide an incentive for more thought and effort to be applied to the problem by those who teach the subject. The Pharmaceutical Syllabus allows mathematics to be given as a separate or as a combined course with other pharmacy courses.

At the George Washington University I have obtained a measure of success by combining into one course the teaching of mathematics with that of beginning pharmacy and employing laboratory work as an aid. According to Griffith<sup>(1)</sup> only about 35 per cent of our colleges use laboratory work in connection with beginning pharmacy. I believe that some laboratory exercises are necessary for the proper teaching of beginning pharmacy, but as Briggs<sup>(2)</sup> has stated, a pure course in pharmaceutical technique cannot be justified, because of the fact that nearly all the processes usually studied are already integral parts of other courses in pharmacy or chemistry. The outline suggested by Griffith, for example, includes numerous duplications of techniques that the student will encounter in later courses. Such techniques include the determination of the melting point, evaporation, decantation, distillation, sublimation, filtration, and separation of immiscible liquids. These are worthy topics for lecture, but they are not used for laboratory study in my course.

Several previous publications have been made regarding this particular educational problem. In 1931, Michelsen<sup>(3)</sup> stressed the value of applying laboratory methods to the teaching of mathematics. DeKay<sup>(4)</sup> states that some pharmaceutical mathematics can be correlated with the techniques of beginning pharmacy for one semester. Michelsen believes that a theoretical training in mathematics is not sufficient to qualify a student for practical work behind a prescription counter. This is the difficulty which my present combination course is designed to help overcome. I attempt to limit it to those techniques not encountered in other courses and to

present the techniques with some mathematical application whenever possible.

The course taught to freshmen at the George Washington University School of Pharmacy consists of one hour lecture and two hours of laboratory each week for one year. It is planned as follows: In the beginning of the first semester the students are asked to read and write summaries of the prefaces to the United States Pharmacopœia, the National Formulary, and the New and Non-Official Remedies, the Pharmaceutical Recipe Book, and the United States Dispensatory. During the semester, the student becomes conversant with the United States Pharmacopœia and the National Formulary by referring to them for tables, formulæ, and percentages needed in the solution of mathematical problems. In the first few lectures the history of pharmacy, the Code of Ethics, the Hippocratic Oath, the Oath and Prayer of Maimonides, and the important publications in pharmacy are discussed. Later on in the pharmaceutical curriculum the students take formal courses in the specific phases of pharmacy, new and non-official remedies, and the history of pharmacy.

A manual has been prepared for the student to use as a laboratory guide. The first experiments concern measurements of length, volume, and weight, in both metric and apothecary systems, and from their results the students arrive at the relationship between the two systems. Other exercises take up variation of drops, the balance, heat and its application, comminution, specific gravity, percentage solutions, and methods of extraction.

In the case of each exercise, the accompanying class work is planned to introduce the subject, to show its pharmaceutical application, and to present problems to be solved. The subject of heat, for example, includes the study of types of thermometers and the solution of conversion problems. Problems in percentage are solved when comminution is discussed. Specific gravity experiments are carried out, using the Westphal balance, the hydrometer, the pycnometer, the hydrostatic balance, and all of these offer excellent opportunities for the presentation of related problems. Alligation is first introduced with specific gravity, and also discussed along with percentage solutions. Problems are presented illustrating the relationship of specific gravity to volume. The subject of solutions, too, provides the means of presenting various types

of mathematical problems. Such problems include those on percentage, stock solutions, alligation, and dilution and concentration. Incidentally, chemicals which produce color, such as potassium permanganate and copper sulfate, are very helpful in teaching alligation and percentage solutions. The work is much more impressive when a student actually sees the color change as a result of his calculations.

A laboratory experiment to teach the dilution type of problem may be mentioned. The student is first required to prepare four fluid ounces of a 2 per cent solution of potassium permanganate in water. Then, using his product, he calculates the required volume necessary to produce by dilution one pint of a 1 to 5000 solution.

Students learn definitions much more readily after related laboratory exercises have been carried out. Even dose rules are more readily grasped if they are applied to some of the laboratory experiments.

In the latter part of the second semester, usually about the middle of March, after techniques have been covered in the laboratory, the entire class time is devoted to pharmaceutical mathematics.

Calvert<sup>(5)</sup> has suggested that a one-year course in pharmaceutical mathematics be given to freshmen and a one-semester course to seniors. In 1932, Klotz<sup>(6)</sup> emphasized the necessity for better mathematical training for pharmacists. He, too, favored a presentation of two courses, one an elementary and the other an advanced course. The suggestions of both Calvert and Klotz, however, concerned courses of theoretical training, whereas at George Washington University the student is required to apply his mathematical knowledge in all his courses, including laboratories, throughout the entire four years. He does not have his knowledge limited to any one textbook, and is better able to cope with the varied problems which arise. Mathematics is an important working tool for pharmacists and the opportunity to use it in actual laboratory work should be provided.

Two studies may be cited to indicate the value of such a course. The first study is that made in 1938 by Gustafson<sup>(7)</sup>, who discovered the five types of problems most frequently missed by students. Of these five types, three, namely on weights and volumes of liquids, percentage and percentage

solutions, and stock solutions, are well suited for combination with laboratory instruction. Secondly, a survey of state board examinations revealed that the problems relating to percentage, to weight and measurement, and to the conversion of weights and measurements constituted a large portion of the examinations. In the light of this knowledge, I believe that the validity of laboratory application in teaching pharmaceutical mathematics is demonstrated.

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## Should Separate Courses Be Offered in Drug Assay and Quantitative Analysis?—The Commercial Pharmacist's Viewpoint\*

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When I was approached about discussing this subject, I immediately formed an opinion. Of course, there are splendid arguments for, as well as against this question. I find, however, that there can be more said on the affirmative side of the question if one has the commercial pharmacist's viewpoint. It is my opinion that in teaching undergraduates there should be separate courses in drug assay and in quantitative

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\*Read before the Conference of Teachers of Chemistry at the 1940 meeting at Richmond.

analysis. I shall try to enumerate briefly the reasons why I think these should be separate courses.

The older I become, the more firmly I am convinced that the average college student is in no position to decide the exact nature of the work he will do when he is graduated. He should, consequently, have the advantage of a broader training in fundamentals. To elaborate on this, suppose a student who is quite technically inclined is employed by a commercial organization. The employer will soon recognize the fact that this person has greater ability than is required for routine testing. The work assigned to him would be of such nature as to take advantage of his aptitude.

Looking at the question from a slightly different point of view, it might be said that since one of the courses is usually taught in the sophomore year, and the other in the senior year, those unfortunate students who are unable to complete their college training will have gained some knowledge in analytical chemistry which may aid them to pursue the life of a more useful citizen. I am familiar with just such situations as these, and I feel that since the foremost duty of our colleges and universities is fundamentally that of producing better citizens, these situations should be kept in mind.

Viewing the question from a more technical angle, it seems to me that a preliminary course in quantitative analysis simplifies considerably the problems which arise in the study of drug assay. This, of course, would not be true if the course in drug assay were so all inclusive as to cover fairly completely the determinations performed and discussed in the usual undergraduate course in quantitative analysis. Speaking again from the viewpoint of the commercial pharmacist, it seems that combining these courses and teaching the combined course over a period of one year would be insufficient training for a graduate who might have to undertake this specialized type of work. Then too, there are many assays which the manufacturing pharmacist is called upon to perform today which are not easily understood unless one is well grounded in the fundamentals of quantitative analysis. An example is the assay for iodine in sodium tetraiodophenolphthalein according to the British Pharmacopœia, according to our own Pharmacopœia, or according to the iodate method described by Jamieson. Also, if one has not had



sufficient practice and has not developed good technique, which would more likely be developed by a thorough study of both of these subjects with plenty of time allotted to each, it seems to me that considerable difficulty would be encountered in performing the complete tests and assays directed in numerous Pharmacopœial monographs. Cyclopropane, in the Second Supplement to the Pharmacopœia, illustrates this point.

You are probably aware of the fact that more emphasis is being given to the need for placing in the packages for sale a product which meets the exact declarations of the label. This can only be accomplished with success when the person in the laboratory is satisfactorily trained. From a commercial standpoint, he should have had a thorough training both in drug assay and in quantitative analysis in order to avoid the pitfalls of cook book chemistry.

A question might be raised about the value of spending all of this time in acquiring knowledge of these two subjects if the graduate expects to join his father in operating a retail pharmacy. This can be answered partly by a cursory examination of the Federal Food, Drug and Cosmetic Act which seems to place a greater demand upon the scientific knowledge of the retail pharmacist; hence the need for an even broader scientific training than that necessary for the commercial pharmacist.

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## Practical Dispensing Pharmacy as Taught at the Medical College of Virginia\*

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Courses in dispensing pharmacy are usually practical in that the methods taught are applicable to drug store prescription work. They are, however, theoretical in that the medicines prepared are seldom used. The students in such courses are less careful than they would be if the prescriptions were filled for actual use. They are apt to consider such

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laboratory work as practice, and hence are not likely to take it as seriously as they should. Frequently students graduate in pharmacy without having filled a single prescription intended for a physician's patient. This is an unfortunate situation. It is one thing to fill a prescription as a student in a college laboratory, but quite another to fill it as a registered pharmacist in a retail drug store. The School of Pharmacy of the Medical College of Virginia attempts to remedy this condition by giving a course in which every prescription filled is actually used.

We are fortunate at our school in having available to us the facilities of the School of Medicine, including three hospitals and a large out-patient clinic. The clinic has over 100,000 patient visits annually, while the three hospitals have a capacity of 464 beds. These are filled the year round. Including staff members, both part and full time, residents and interns, over 150 physicians write prescriptions during a year. The hospitals require an average of 75 prescriptions daily, in addition to sterile solutions, floor baskets and other supplies. In the out-patient clinic, 150 prescriptions are dispensed each day. No hospital formulas or stock numbers are used. These prescriptions are written out completely, and are for official and extemporaneous mixtures. All are filled in the college pharmacy.

The pharmacy is a large modern laboratory located on the ground floor of the clinic building. It is divided into the clinic, the hospital and the manufacturing sections. All are available for student use. In fact, the pharmacy was planned primarily with student dispensing in mind. It is staffed by a chief pharmacist, two other full time pharmacists, a part time pharmacist, and a pharmacy intern. Each of these is registered. The first three are used for instructional purposes during dispensing class periods. Elementary dispensing is taught as a practice course during the junior year. It is prerequisite to the course described in this paper which is a senior subject. The work in the various sections of the pharmacy will be discussed in order.

#### *The Clinic Pharmacy*

The section of the pharmacy employed for this portion of the course is similar to any modern dispensing laboratory. It

consists of four complete prescription desks, each accommodating two students, and having its own balance, chemicals, bottles and necessary equipment.

At the beginning of the session, the seniors are divided into sections of six to eight students each, depending upon the size of the class. These sections are rotated in the clinic pharmacy, each serving two periods of three hours each per week, throughout the session. As the senior class seldom exceeds 25 members, three sections are usually adequate.

Two registered pharmacists are in charge of each section, one from the pharmacy staff previously described, and one from the teaching faculty of the college. A total of six registered pharmacists take part in supervising this work. Every measurement, weight, procedure and label is checked.

Probably the general procedure can be illustrated best by using a typical prescription:

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|--------------------------|-------------|
| Sodium Bromide           | dr. iv      |
| Tr. of Belladonna        | fl. dr. ij  |
| Elix. Lact. Pepsin. q.s. | fl. oz. iv  |
| Sig: One teaspoonful     | t.i.d. p.c. |

The student is assigned this prescription. He takes it to his desk, checks the dosage, decides upon the method of procedure and then begins filling it. He counterbalances the sodium bromide, places the shelf bottle beside the balance, and before removing the salt from the balance pan raises his hand for a check. An instructor inspects the material and weighing. If it is correct, he puts his initial opposite the ingredient, thereby assuming responsibility for it. The student then dissolves the sodium bromide in an appropriate quantity of the elixir in a mortar. The solution is then poured into a four ounce graduate, the tincture is measured, checked and added, and the whole brought up to volume by adding the vehicle. The final measurement is then initialed on the prescription by an instructor. After bottling the preparation, the label is typed and attached. It is then inspected critically and, if approved, the instructor writes his initials on the back of the prescription beneath the name of the student. Finally, the finished product is wrapped and delivered by carrier to the patient. The student is then assigned a prescription of a different type and proceeds as before. During compounding, the instructors in charge discuss the prescrip-

tion with the student and ask questions which they consider important.

During the first month of the course, the students are expected to familiarize themselves with the stock and with the general routine of prescription compounding. From this point on they are made to assume steadily increasing responsibility. At the end of the course they are expected to fill the general run of prescriptions without help, and to be well informed regarding the problems involved. Speed is not emphasized until the second semester.

At the end of the first month each student is given a blue book, and is required to list the number and types of prescriptions he fills each period. Each mistake made is recorded in the book by an instructor. This has a salutary effect upon the students. It tends to make them more careful and more thoughtful, as they wish their books kept as free from errors as possible.

As mentioned previously, the laboratory periods are three hours in length, and therefore enable each student to spend an average of six hours a week in compounding. In the beginning, about seven prescriptions are filled per student per period, but by the end of the course this number is increased to approximately fifteen. These include many different types such as solutions, tablets, bulk powders, lotions, capsules, charts, ointments, etc. During the session, a total of approximately 600 prescriptions is filled by each student.

#### *The Hospital Pharmacy*

Hospital sections are composed of three students. Each section serves three three-hour laboratory periods a week for approximately four weeks. These sections meet simultaneously with the clinic sections but are separate from them, and are under the supervision of a third instructor. The same procedure is carried out here in regard to prescriptions as has already been described. The prescriptions differ, however, from those in the clinic pharmacy in that they direct the use of more proprietaries, ampules and other special forms of medication. Besides prescription work, the students are taught to fill, seal and sterilize ampules and to use the autoclave. They are shown also how to prepare sterile solutions in 1000 cc. quantities and are instructed in the filling of hospital baskets and in the general procedure employed in keeping the hospitals supplied with medicines.

*The Manufacturing Section*

This is located in a laboratory adjoining the hospital pharmacy. Manufacturing sections are composed of three students each. A fourth instructor supervises this work. This is our newest division and is now in the process of development. As a rule, ointments are made in five pound quantities; elixirs, syrups and tinctures in one to four gallon lots, and the antiseptic solutions of the National Formulary in quantities of five gallons each. In this division the students again become familiar with the ingredients and methods of manufacture of the galenical preparations they use in compound-ing prescriptions. The cost of each preparation made is computed by the student, and compared with the current whole-sale price of the finished product.

With further reference to clinic and hospital prescriptions, it should be stated that some of them are routine in nature and hence have little teaching value after the first month. These are not allowed to become a burden to the students. As soon as prescriptions become routine, they are diverted from student channels and are filled by a member of the staff.

The attainment of a satisfactory rating in practical dispensing pharmacy is required for graduation. At the end of the second, third and fourth quarters, the six pharmacists who supervise this work meet and ballot on the proficiency of each student. Those who are considered safe dispensers are given grades which range upward from the passing mark. Those who are adjudged unsafe are denied graduation even though they may have shown outstanding proficiency in other subjects. .

A course as described above bridges the gap between theoretical dispensing pharmacy and actual drug store practice. It remedies the condition wherein a student graduates without having filled a prescription for actual use. It gives confidence to the inexperienced graduates. We believe that courses of this nature should be included in the curricula wherever conditions warrant their presentation. We suggest that the Syllabus Committee study the practicability of including this type of course as a required subject in the pharmacy curriculum.

## Should Separate Courses be Offered in Drug Assay and Quantitative Analysis\*

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When the request came to me from the Secretary of this Conference to present a paper on the above subject, my first impulse was to find out how the various schools are handling the problem at the present time. A study of the catalogs of some fifteen member colleges, picked at random, revealed that thirteen offer separate courses in quantitative analysis and drug assay, or some phase of it, and that in eleven cases both courses are required ones in the curriculum. This would indicate that the majority of schools are favoring the affirmative side of the question.

It need hardly be mentioned that quantitative analysis is regarded as one of the basic courses in the chemistry training of the pharmacy graduate. We will all agree with the statement made by Beal ten years ago that a proper training in the fundamental principles of quantitative analysis is essential for the student who proposes to master its technical applications and to interpret properly the data so obtained.<sup>1)</sup> I, personally, am in hearty agreement with the point emphasized by Dr. Hartung in his excellent paper read before this conference last year.<sup>2)</sup> He showed that the basic chemical training of the pharmacist, whether quantitative or otherwise, must be the best available or at least on a par with like training received by the chemistry graduate.

We are admittedly training students primarily for the practice of pharmacy in the retail and professional fields; beyond that we are also training them to qualify for positions in commercial laboratories, pharmaceutical manufacturing houses, government laboratories, and many other allied fields. With the coming of more stringent food and drug laws, the emphasis on the analysis of drugs and drug products will be greater than it has ever been in the past. In the administration of these new laws, better trained pharmaceutical chemists will be needed, and if our pharmacy graduates are to compete successfully with the chemistry graduate for such

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\*Read before the Conference of Teachers of Chemistry at the 1940 meeting at Richmond.



openings, they must be equipped, not only with sound basic training, but also with additional applied training in such courses as drug assay. Eight years ago Taylor<sup>4)</sup> stated, *"It must be realized that each laboratory has its own special system and requirements for an analyst, and while it is impossible to prepare the student for every specific routine in the laboratory, we can and must see that he is trained in the methods, technic, and mental attitude that will enable him to adapt himself quickly to the requirements of any particular situation."* If that statement was true at that time, it is even more so now.

If we are prepared to admit, then, that both quantitative analysis and drug assay should be included in the curriculum, what is the best arrangement for teaching them? Can the proper training in the fundamentals of quantitative analysis be obtained in the best manner from a combination course of quantitative analysis and drug assay? The answer to this question depends to a large extent upon what we mean by the term, *drug assay*, and the content of such a course, to which I shall refer later. There are arguments both in favor of and against such an arrangement. We are all aware of the fact that our curriculums in pharmacy are highly specialized in a great many respects, and that they are also crowded, even to such an extent in some cases that we are unable to find room for some subjects which we should like to include in them. It is true, then, that a combined course would result in the saving of much needed space in the curriculum. Moreover, the argument has been advanced by some that quantitative analysis, from the point of view of the time required for the course, is a most expensive way of teaching chemistry. They point out that no new chemistry is taught in the course; rather, it is an extension of some of the principles expounded in the first course in general chemistry, and the repetition of a dozen different analytical procedures, routine in nature, in the laboratory is a waste of valuable time. As such, they point out that it might well be disposed of along with qualitative analysis in the all-inclusive first course in general chemistry. Such arguments, I feel, are worthy of serious consideration by those teachers of chemistry who are dealing with the general student who is taking, let us say, ten credits of general chemistry to fulfill the science requirement for the bachelor's degree. For the pharmacy

student who is seeking this degree in a highly specialized field closely allied to chemistry, such a cursory treatment of quantitative analysis would certainly be insufficient for his later needs.

Let us grant, for the moment, the truth of the above argument that no new chemistry is to be learned in the course in quantitative analysis. When we consider that the purposes of such a course, as set forth by Beal,<sup>1)</sup> James,<sup>3)</sup> and others, "are to emphasize the quantitative character of chemical reactions"; "to develop on the part of the student a technique that in addition to teaching specific procedures emphasizes exactness of operation"; and "to develop the capacity to understand and interpret the fundamental principles underlying the procedures and methods used", we readily see that there is in these purposes no incompatibility with the above argument. There is, rather, a misconception on the part of those who propound the arguments. Quantitative analysis, instead of teaching any new essential chemistry, attempts to utilize those principles already learned in the general course to develop a general technic of operation and an understanding and interpretation of the same principles.

The chief dangers in teaching quantitative analysis and drug assay in a combined course lies in the fact that the fundamental principles of quantitative analysis are likely to be slighted in order to emphasize the application of such principles to pharmaceutical analysis. This would result in a situation comparable to the often criticized courses in inorganic pharmaceutical chemistry and others which have degenerated into courses in *chemicals* rather than chemistry. Such criticism of pharmaceutical chemistry has been heard too frequently in the past, and we should use all possible care to see that the causes for such criticism are eliminated. In my opinion, a course in drug assay, if taught properly, is far too comprehensive and all-inclusive to even attempt to teach it in the same course with quantitative analysis.

The amount of credit given to these courses in the curriculum is largely a matter of the time available and the requirements of the individual curriculum. However, it would seem that quantitative analysis should be given for at least four semester hours credit, including six hours of laboratory per week, and the course in drug assay should be given for at least three, preferably four, semester hours credit,

including six hours of laboratory per week. It hardly seems necessary to dwell at any length on the content of the course in quantitative analysis. We may dismiss it with the observation that it is well and good for such a course to be taught by a chemist having a pharmaceutical background, and for him to bring in as many of the U. S. P. and N. F. assay processes as possible, *provided* the course is kept as a fundamental course, and *provided* it is emphasized that the official assay processes, without orienting the students in the general field of quantitative analysis, may lead to the teaching of a course in *quantitative pharmaceutical chemicals* instead of quantitative chemistry.

It would seem from observation that the content of the course in drug assay should receive much more thought and consideration than it has received. In studying the meager descriptions of those courses found in the catalogs referred to, I found such titles as *Pharmacopoeial assaying and testing*; *Volumetric analysis and alkaloidal assaying*; *Alkaloids, sugars, oils, pH, etc.*; *U.S.P. assay*; *Quantitative pharmaceutical analysis*; and many others. What the contents of these various courses may be is a matter for conjecture. The point I wish to emphasize is that the course in drug assay should be an *applied* course, dealing with as many different and varied drug products as it is possible to include, and it should not be confined to the official assays. If the course in quantitative analysis has drawn on the assay processes of the U. S. P. and N. F. chemicals for illustrations, it is most certainly a duplication and a waste of time to include such assays again in an applied course. Many of these courses in drug assay apparently emphasize alkaloidal assaying to a large extent. Is it not of equal importance to provide training for the student in the assay for active constituents of pharmaceuticals, including such products as ointments, compressed tablets, elixirs, ampuls, liquors, tinctures, and other commonly used products? Such assays should be run not only on the official pharmaceuticals, but also on non-official proprietary preparations. In this way the student becomes familiar with the nature of the problems with which the analytical chemist in a government laboratory or a manufacturing house is confronted. Furthermore he is made aware of the fact that his pharmaceutical bibles, the U. S. P. and N. F., do not contain *all* of the information he needs to

know, and he learns to seek information elsewhere than within their covers.

Obviously the U. S. P. and N. F. will not be sufficient reference books for the work in such a course. Liberal use should be made of other works on the subject, especially the Official and Tentative Methods of Analysis of the Association of Official Agricultural Chemists, and frequent reference to current literature should be an important part of the course. It should also be emphasized that the course must be revised from year to year in order to keep it up to date. In such a course, the student may be inspired to work out his own problems and to develop a self-reliance which will mean much to him in his later activities, either as a professional pharmacist, or a pharmaceutical chemist. Needless to say, a student's interest in such work is easily stimulated and maintained by asking him to purchase some pharmaceutical in the store and analyze it to see if it meets the label requirements.

Without presuming in any way to set up an ideal course in applied drug assay, I should like to present for your consideration a portion of the subject matter which I would include in such a course:

- Alcohol determinations on galenicals, and proprietary liquids.
- Index of refraction of oils.
- Optical rotation of pharmaceutical chemicals, oils, etc.
- Viscosity and colorimetry determinations.
- Ash, moisture, crude fiber, and extractive determinations.
- Potentiometric determination of pH of pharmaceuticals.
- Potentiometric assays involving acidimetry, alkalimetry, and oxidation-reduction.
- Fat constants, both physical and chemical.
- Volatile oil assays, both for chemical constituents of a pure oil and for volatile oil content of pharmaceuticals.
- Alkaloidal assays on crude drugs, extractive preparations, tablets, capsules, ointments, etc.
- Enzymic assays, amylolytic and proteolytic, on enzyme preparations.
- Acidimetric and alkalimetric assays of tablets, liquors, elixirs, ointments, etc.
- Oxidation-reduction assays of tablets, masses, ampuls, tinctures, spirits, ointments, liquors, etc.

If there are in the curriculum, courses in food chemistry, biochemistry, or others, there will be the possibility of some duplication in such subjects as volatile and fatty oil analysis, optical rotation, etc. Such duplication may easily be avoided by the proper coordination of the various courses in the

curriculum. There is no limit to the type of preparation that may be given for assay purposes. Also, as has been pointed out by others, such a course could be given in cooperation with the work in manufacturing pharmacy or with the hospital dispensary. To offer an illustration, at our school we are fortunate in being able to supply state asylums, schools, hospitals, and other state supported institutions with many of the commonly used manufactured pharmaceuticals. This provides a good outlet for the products prepared in the course in manufacturing pharmacy. Under such an arrangement a portion of the course in drug assay may be used in checking the quality of the preparations which are manufactured, at the same time providing an excellent training for the student in drug assay and pharmaceutical control work.

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## A Course in the Theory of Parenteral Solutions and Related Topics

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It is the belief of the writer that certain subjects are inadequately covered, poorly correlated, or neglected entirely in our pharmaceutical curricula. The course described in this article has been developed and tested over the past three years. So far as is known, this was the first effort to organize and to correlate the data herein outlined. Thanks are due to Washington State College for furnishing the opportunity to offer and develop this work.

Briefly stated, the objectives were: (a) to give the student rather full information regarding the principles and calculations involved in the preparation of isotonic solutions, and (b) to supplement his training with pertinent facts of a biophysical nature which would be useful to the student preparing for hospital or manufacturing pharmacy, or for medicine. It was later discovered that certain students interested only in the retail business considered the work useful to them, and

one retailer-alumnus paid a \$40.00 enrollment fee to take two courses, of which this was one.

In describing this course to the teachers of pharmacy, it must be emphasized that probably no other school should give the material exactly as outlined below. Certain variations must be made, depending upon the amount of such information given in other courses which the students had taken, or would take. The major themes which were kept on the students' minds were "rational, not empiric, use of formulas," and "fundamental principles rather than mere procedures." It was gratifying to note how interested, and amazed, a student can be when he learns that the gas laws which he studied as a freshman can be applied to dilute solutions in isotonicity calculations. The outlines for the lecture and laboratory work as the course was given at Washington State College follow, (the numbers preceding the paragraphs refer to lecture periods; the italics are general subject headings).

#### Lecture Work

##### 1. *General survey of content; references.*

This appraisalment, presented on the first day of class, is believed to be an excellent practice, for the students may thus be made to see the objectives of the course. Knowing these, they do not question the teacher's excursions into the by-paths of the subject, which deviations he feels are essential to a good understanding. The first day of class is also the best time to inform the class that the course deals only in part with parenteral solutions, and to arouse interest by a few pertinent questions relating to the remainder of the course. Thus, any later antagonism and feeling of having been duped is avoided. It is believed that the proper handling of this first class period can make the difference between an apathetic, mediocre class, and a good one.

##### 2. *Introduction to parenteral therapy; how it may be accomplished; differences in effects; factors affecting drug action, etc.*

This lecture is based upon the introductory chapter of Dutton & Lake's "Parenteral Therapy." (1) A perusal of this chapter will indicate a broader meaning than is usually given the term "parenteral." The use of this definition helps to justify some of the apparently unrelated material given later.



3-9. *Meaning of isotonicity, etc. Osmotic pressure and its importance in medicine. The gas law; Avogadro's law; discovery and measurement of osmotic pressure; its relation to the gas laws. Preparation of isotonic solutions; calculations, graphical methods.*

This series of lectures begins with definitions, and continues with inferences concerning the dependency of isotonicity on the amount and character of the dissolved material. A quick review of the gas laws follows. Pfeffer's experiments and conclusions, together with a little of his data, serve to relate these gas laws directly to dilute solutions. Pfeffer's data, together with van't Hoff's later calculations, also prove the applicability to solutions of Avogadro's law. Next, we mentioned some errors of the osmotic pressure equation (ionization errors and Van der Waal's forces), then the various forms in which it could be used to find molarity and concentration, and even to determine which of several suggested compounds was present in a solution.

At this point, several problems in the form of isotonic prescriptions were given out for homework. Later, these problems were solved by other methods (*vide infra*), which helped to emphasize the lack of uniformity in results when different procedures were used.

The Nicola (2) formula was then analyzed, and his isotonic factors and constants were rationalized, and shown to follow from the fundamental facts previously presented. At the same time, it was pointed out that his dissociation constants and his factors were only approximations. The Brown (3) and Nixon (4) methods were discussed similarly.

Next, a brief description of various indirect methods of measuring osmotic pressure was given. Finally, this was followed by a comparison of osmotic pressure with diffusion, a recapitulation of the bearing of osmotic pressure on biological phenomena, and a word about the osmotic pressure of colloidal solutions. The latter is not only pertinent, but helps to justify for the student the later discussions in Lecture 25, *et seq.*

10-21. *Other factors which should be considered in the preparation of parenteral solutions: pH; why control this factor?; pH of water. Buffers, meaning, importance, etc. Blood mechanisms for the control of pH. Factors influencing the pH of buffers. The Hasselbach equation,*

*and its application to buffered solutions; significance of  $pK'$  and ratio  $\frac{(BA)}{(HA)}$ . Titration curves and their uses. Colorimetric measurement of pH; advantages and limitations; theory of indicators. Electrometric measurement of pH; solution tension and other fundamentals; quinhydrone and other electrodes, including advantages and limitations. Conclusion and summary.*

No doubt, many who read this will feel that all the material mentioned in this unit is adequately covered in the various chemistry courses, but this is believed to be largely untrue. Communication with pharmacy students and instructors, as well as with chemistry teachers, has led to the conclusion that while most students have heard of perhaps fifty per cent of this work, they can use almost none of this information intelligently in solving practical pharmaceutical problems. When, however, someone thoroughly interested in pharmacy describes this work, frequently picturing possible situations in which the knowledge would be useful to the student, the response is gratifying. The student begins to think and to ask questions which help to make the course live.

After first calling attention to the importance of pH in biological processes, the law of mass action was quickly reviewed. Following this, came the pH of water, and finally the Hasselbach equation for the pH of buffer mixtures. In the light of the foregoing, the dissociation of acids, bases, and salts, and the effect of the latter on ionization were discussed. This material led quite logically to titration curves, and finally to a word about amphoteric electrolytes.

The  $pK'$  of indicators brings up the subject of their theory from a different viewpoint than the students have had previously. The sum total of this work, and laboratory experiment No. 3, had the effect of producing (usually for the first time) a real understanding of the necessity for a careful choice of indicators and buffers in any given piece of work.

The theory of the hydrogen electrode was given in some detail. (Incidentally, it was noted that if early in this discussion, one was careful to mention the term "osmotic pressure" by comparison with solution pressure, the effect was almost magical on some students. These people had evidently feared this section of the course, but were immediately

put at ease by hearing this term they knew and had mastered previously.) After the groundwork was laid for the hydrogen electrode, it was relatively simple to dispose of the calomel, quinhydrone, and glass electrode. Needless to say, the principle of the potentiometer was reviewed along with the other material mentioned.

22. *Importance of viscosity. Kidney and liver functions. Hemolysis.*

The material called to the attention of the class is indicated in Chapter 1, of Dutton & Lake. (1) This work completed the consideration of the principal factors affecting the preparation of solutions for injection. Some thought was given to the possible use of this time for a little more thorough discussion of viscosity, but the classes always felt that they would be more interested in the material to follow. Since not everything could be included, the sentiment of the class prevailed.

23. *Inhalation. Ionic medication. Theory and calculation of dosages for various substances which can be so administered.*

This lecture was based on Chapter 30, of Dutton & Lake's *Parenteral Therapy*.<sup>(1)</sup>

24. *Other types of parenteral therapy.*

About one or two class periods devoted to a discussion of various common types.

25-31. *Colloid chemistry as a means of understanding biological phenomena; introduction; classification and mechanical properties of colloids; electrical properties; precipitation by electrolytes; protection and mutual precipitation of colloids; phenomena of surface tension and adsorption as applied to enzymes, toxins, antitoxins, adsorption compounds, action of drugs, purification by adsorption, etc. Emulsions, emulsoids, syneresis. Catalysis.*

This unit of work began with a review of the properties mentioned above, a part of which most students have had. However, in this case terminology and pharmaceutical and biological applications were emphasized. These applications were brought home by creating hypothetical situations with which the pharmacist might be faced, and then by suggesting their solution; *e.g.*, a pharmaceutical preparation remains cloudy, due to some impurity not removable by filtration. What can

be done if one does not wish to add a chemical precipitant or charcoal? Some other examples are how can the color changes of a colloidal solution be used for certain diagnostic tests, and how does one explain the fact that the blue eyes of newborn babies change color in later years?

The surface phenomena of colloids lead not only to any amount of work on emulsions, enzymes, *etc.*, but also to surface tension. The latter can be discussed most profitably as an aid to the evaluation of germicides, soaps, *etc.*

Adsorption also suggests several things besides routine purification processes, *e.g.*, chromatographic analysis, and partially explains the reason for the apparent deterioration of liquid enzyme preparations on shaking. The adsorption isotherm was also discussed and some of its possible applications were given.

Since emulsoids are usually proteins, it was felt necessary to say a word about their amphoteric properties, and therefore about isoelectric points.

### 32. *Review and summary.*

### Laboratory Work

For about fifty per cent of the time, the class was sent to the library to prepare suitable reports on some subjects of interest. An example is the sterilization of parenteral solutions. In this case, the students were each assigned a definite period of years to review in a certain journal. The reports were handed in, edited by the instructor, and mimeographed. When completed, each student received a summary of all the reports, and a class discussion followed. In most cases, however, the assignments were for definite articles, each student having a different one. Every effort was made to select articles which would be useful in supplementing the lecture material under discussion at that particular time. About half of each laboratory period so used, was then taken for reporting the articles previously assigned. Incidentally, it may be noted here that this method of procedure was the chief reason why such a full lecture schedule could be maintained. The students not only supplemented their lecture material, but also reviewed it through the medium of the discussions which followed their reports.

The actual laboratory work performed consisted of the

following experiments adapted to our interests from various texts:

1. *Study of diffusion and osmosis.*

The reference works given later will suggest the scope of this experiment.

2. *Effects of varying concentrations of sucrose on the cell sap and Elodea.*

This exercise was chosen after some discussion with the plant physiologist. Briefly, it consisted of the observation through the microscope of the plasmolysis and plasmoptysis of very thin sections of *Elodea* when immersed in sucrose solutions of various concentrations. The students were also required to determine the strength of solution which would have neither of these effects, and thus calculate the approximate osmotic pressure of the cell sap.

3. *Selection of indicators for analysis.*

This experiment is almost a classic for the purpose, and can be adopted from various laboratory manuals.

4. *Use of the block comparator for pH measurements.*

Same comment as for No. 3, except that certain pharmaceutical preparations can be used (with caution).

5. *Use of the quinhydrone-calomel electrode.*

The same materials measured in No. 4 were also used in this experiment. However, the apparatus was carefully explained and demonstrated to the students before they were allowed to use it. The choice of the quinhydrone-calomel set-up was made on the basis of availability, not desirability.

6. *Construction and use of titration curves.*

This exercise proved the general shapes of titration curves, and made possible the inference of several other things mentioned in lecture.

7. *Some properties of colloidal systems.*

The properties of colloidal systems demonstrated were sol and gel formation, reversibility and irreversibility, protection, precipitation (including color changes), adsorption from solution, etc.

8. *Preparation and study of some silver-protein pharmaceuticals.*

This experiment was really a continuation of parts of the preceding one. In this case, the students made silver sols and

determined their properties before and after adding the protecting emulsoid.

9. *Illustration of some facts concerning surface tension.*

Both the tensionmeter and drop methods were used to show the effects of various substances in raising and lowering surface tension.

All laboratory directions were given out on mimeographed instruction sheets, each of which also listed several questions. The latter served to emphasize certain laws or principles, and forced the student to read more references. This system of alternate laboratory and library work has an additional advantage in that both types of assignments can be arranged to correlate almost perfectly with the lecture work.

#### References Used

The following works were put on the reserve shelf for this course. They are arranged in their approximate order of usefulness.

- Steel—Physical Chemistry and Biophysics
  - Dutton & Lake—Parenteral Therapy
  - Gortner—Outlines of Biochemistry
  - Findlay—Physical Chemistry for Students of Medicine
  - Phillips—Physical Chemistry
  - Wishart—Biophysics
  - Bechold—Colloids in Biology and Medicine
  - Alexander—Colloid Chemistry
  - Wokes—Applied Biochemistry
  - Sollmann—Manual of Pharmacology
- Other books were less frequently used.

#### General Comments

The first year the course included several lecture periods on selection and care of equipment, sites for injection, techniques, parenteral anesthesia, injection treatments for hernia, hydrocele, etc. However, it was felt that these things probably did not belong in a pharmacy curriculum, and that even if they did, they were nothing more than memory work, and were contrary to the principal themes which had been adopted for the course. Accordingly, these parts were dropped, and in their place the material on osmotic pressure and pH was expanded to the extent indicated above.

After three years' experience, it was planned that henceforth the course should be open to seniors and graduate students only, as most of the juniors found it a bit difficult.



Furthermore at Washington State College, the senior can usually find more time to devote to an elective course than can a junior.

Another proposed change was the introduction of some laboratory and lecture work on the actual techniques involved in the preparation of ampul solutions. However, much of this work is empirical, and therefore is not compatible with the guiding principles of the course.

#### Conclusion.

It is hoped that the outline here presented has included some helpful suggestions to schools which may be interested in such a course. It seems to the writer that most of the material is particularly appropriate at this time when so many students are interested in hospital pharmacy, and are preparing themselves for the study of medicine. In fact, the course was originally suggested by a student who had gone on to medical school, though it is doubtful if this person would recognize her ideas after the evolution which they have undergone.

#### Literature Cited

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- (2) Scoville, W., & Powers, J. L., "Art of Compounding," P. Blakiston's Son & Co., Philadelphia, (1937).
- (3) Brown, H. T., *Pharm. J.*, 122, 324 (1929).
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NOTE: The writer wishes to acknowledge the encouragement and advice received from the late Dr. W. G. Crockett during the preparation of this paper.

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## The Ninth Educational Conference\*

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This conference was held in the Biltmore Hotel, New York City, on October 31 and November 1, 1940, under the joint auspices of The Educational Records Bureau, The Co-operative Test Service, The Committee on Measurement and Guidance of the American Council on Education, and The Commission on the Relation of School and College of the Progressive Education Association. The conference occupied

two full days in the form of morning, luncheon and afternoon sessions as well as one evening dinner meeting. Interesting speakers were provided for all of these and this report of your representative at the Conference covers all sessions and functions. Great interest was shown by the 300 to 400 persons in attendance as was evidenced by their attention and by the nature of the discussions which followed the various speakers on the program.

The meeting opened Thursday morning under the Chairmanship of Frederick H. Blair. The key-note of this session was national defense. The first speaker was Floyd W. Reeves of the Advisory Commission to the Council on National Defense and Advisory Committee on Selective Service. Mr. Reeves' subject was *Education and National Defense*. He outlined and stressed the responsibility of our educational institutions, particularly those of our vocational and technical schools in relation to national defense. He stated that vocational training has responded most extensively to the demand of national defense and that results are so satisfactory and promising that Congress has made available for trade and industrial training the sum of \$60,500,000.00 to be expended by June 1941. \$26,000,000.00 of this money is to be expended for the continuance of work started last summer; \$9,000,000.00 for training in specialized fields, particularly aircraft, in which case the funds are made available to non-profit engineering institutions and include \$10,000,000.00 for special training courses in the mechanical operations on the farm—made available for the rural youth. Over 10 per cent (\$7,500,000.00) of the total allotment is to be spent on the W. P. A. School Systems. He further stated that the Defense Committee has recommended an increase in funds for the con-

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\*Dean Schaefer covered the Conference as a representative of the American Association of Colleges of Pharmacy. With the report he sent this note,—“I am afraid the report is too lengthy. However, the Conference was so extremely interesting that to render any other kind of a report would not be doing justice to the meeting. Too often, in my opinion, we read reports of such programs which simply refer to ‘interesting papers’ and such other generalities. I will not, however, take it amiss if this report is not published since I have profited sufficiently by attending the meetings.” The report is printed in full. Dean Schaefer has given in a nutshell a year's work by the best minds in the field and which required two days for a full expression. He has given us an intellectual treat and what is even of more importance, he has imbued us with the spirit of the Conference.—Editor.

tinuance of the fine work of the National Youth Administration and the Civilian Conservation Corps. The fine work of these organizations and the benefits derived from expenditures in this direction are acknowledged by all. He stressed that a new phase of education has been started by the Committee, wherein closer cooperation within the defense industries is planned and this is being conducted in 22 industrial centers.

The next speaker, Mr. C. E. Jackson, was not scheduled on the program but gave a highly interesting talk on the work and accomplishments of the Council for Democracy. According to the speaker the Council has for its object the *Education and Revitalization among the Citizenship for Democracy*. The Council does not participate in any F. B. I. work, nor does it aim to influence legislation. The Council feels that through educational means democracy can be strengthened and it uses all possible devices (radio—pamphlets—advertising, etc.) to apprise the public of the benefits of democracy. He further stated that this work must be conducted in order to prevent America from adopting a "Maginot mentality." Particularly important is the work of the Council at this time when the results of the election tend to create a "mentality sit down strike" and an air of indifference on the part of the losing party. Mr. Jackson announced the contemplated rally at Carnegie Hall in New York, as well as in numerous other parts of the country. The object of these rallies is to create a spirit of good feeling and unify activity for promoting democracy. The Council for Democracy aims to collaborate with the numerous organizations working for democracy as a sort of clearing house, whereby unnecessary duplication and useless repetition will be prevented.

The next paper was *Work Camps and Education* by Kenneth Holland, Associate Director of the American Youth Commission of the American Council on Education. The speaker stated that over 300,000 men and women in the United States are engaged in work pertaining to the camp movement. This number is almost equal to the number of freshmen enrolled in the colleges of this country. It is estimated that the fine work of the Civilian Conservation Corps has cost each family in the last seven years about \$83.00. Work camps in this country differ from those in Germany and other totalitarian countries in that they do not enslave the American youth and in that they do not indoctrinate them with any political prin-

ciples. Mr. Holland briefly discussed the origin and development of the work camps and then presented the objects of the ideal work camps. The work camps aim to educate the people to a realization that work and especially out-door work makes for better men. It is generally agreed that the out-door work, particularly surveying, engaged in by George Washington, and the rail splitting by Abraham Lincoln, improved these men considerably. The work camp aims to create in the youth a desire to do vigorous and constructive outdoor work. In addition to educating the youth to the belief that labor is the lot of man and creating in youth a desire and appreciation for out-door work, the work camps educate and train the youth in the principles of good health and in first aid administrations. Another very important function of the work camps is that of socializing youths from various parts of the country. These youths from various classes work together, study together, and learn to understand one another. Work camps are here to stay and the problem now is to co-ordinate these camps with the school systems. The camps are to become an integrated part of the school system for this would materially help the youth to find his place in a democracy.

The speaker at the noon day luncheon on Thursday was J. Edgar Park, President of Wheaton College and his subject, *Catching Up on History*. This address served as a splendid dessert to the fine luncheon. Dr. Park pointed out that our path in life today is so different from that of the past and that our knowledge of the past is of no benefit to us. The present ways of life are so different from those a short time back. Who, for example, could perceive only a few years back that man would plan to destroy, predict how he would destroy, and then go on to conduct his pre-meditated plan of destruction? Who a few years ago could grasp any such way of life, wherein an individual or a nation is befriended up to the moment it is destroyed by all sorts of intrigue? These ways of life are new and although a few years ago they were beyond comprehension, they are now more or less understood. This new road of life makes it necessary that we change our educational ways. Dr. Park offered the following slogans to our schools:

1. We train you to give.
2. Our path is steep.
3. We act though we are free to act.

Dr. Park then went on to elaborate on his slogans in a most interesting and effective manner. Briefly, much more can be achieved when one realizes that "All must give to enrich all." Drilling and disciplining cannot accomplish as much as will the training to give, the training to cooperate. It is the duty of the schools to inculcate and instill in the youth the desire to give and to cooperate so that all may benefit. "Our Path is Steep" seems to be overlooked by educators and schools. The trend in the past has been, "children, here is something you will love"—"please, pay attention." This attitude, this trend secured very little response. More can be accomplished, the response is greater, when the appeal is made on the behalf of something being incredibly hard. Churchill, in his plea to the English did not present a rosy picture. On the contrary, he presented a dreary, incredibly hard, unbelievably difficult task and offered to his people, "Blood, tears and sweat." Look at the response—a response inconceivable, had the plea been made in accordance with the trends of the past. It, therefore, becomes the duty of the schools to awake in the youth a realization that "Our Path is Steep"—remembering that we grow soft when we have a good time and that no one knows how much he can do until he is called to do the almost impossible. Thirdly, "We act though free to act"—what does this mean? In the past, to be free meant that we need not act. We have been free so long that we cannot act; we are so free that we do not know how to act. America at present is so free that it cannot act in its effort to help England although America wants to help. This is the outcome of the history of the past. The future, however, demands that "We act though we are free to act."

The Thursday afternoon program was under the chairmanship of Henry W. Holmes of Howard University. The Speaker was Carroll R. Reed, Superintendent of the Minneapolis Public Schools and President of the American Association of School Administrators. Dr. Reed stated that the selection of the teacher is of primary importance, for it must be remembered, "As is the teacher so is the school" and presented the problems confronting the Superintendent in the Minneapolis area and for that matter wherever school teacher examinations are not conducted. The pressure applied by the politician and the commercial placement agencies, and the almost stereotyped recommendation from the teacher training institutions make

the need for examinations a most vital one. In New York City, in other large cities and for that matter in many small ones too, the speaker stated, this condition is not understood, since the teacher examinations have remedied the difficulty, but where the politician and the commercial agency are the factors and where definite standards are lacking we find the teaching profession is the refuge for the timid—a condition which does not permit the teaching profession to be on a par with medicine, law, and theology.

Dean Herbert E. Hawkes of Columbia University presided at the banquet held on Thursday evening. This was a well attended and inspiring function. Dean Hawkes, in his brief introductory remarks called attention to the fact that there are two groups of educators—the experimentalists and the conservatives. He said that the experimentalists were considered by some as having both feet *off* the ground while the conservatives have both feet *on* the ground. In Dean Hawkes' opinion we should follow a middle course for only by having one foot on the ground and one in the air can we move forward and make progress. In a few well chosen words he then introduced Prof. Mark A. May, Director of the Institute of Human Relations of Yale University. Dr. May's subject was *Education in an Anxious World*. He outlined the differences in the thoughts of the general public on the war situation as they existed in 1914 and as they are today. He stated that in 1914 the predominant feeling which caused this country to enter into the war was anger—anger because of the sinking of our ships—anger because of the general ruthlessness of the war—anger because of sabotage activities of foreign agents in this country. Today, however, Prof. May thought that the predominant feeling which may drive us into the war is anxiety—anxiety of the future—anxiety because of the threatened loss of our democratic institutions—anxiety because of the fear that Great Britain might lose with all the resulting consequences to us and our Nation. He outlined the various factors which cause an increase or decrease in this feeling of anxiety and predicted the stage of anxiety at which public opinion would force this country into the war.

The Friday morning program was under the chairmanship of Max McConn, Dean, New York University. The first speaker was George Crile, M. D., who presented a paper on the



subject *A Neuro-Endocrine Formula for Civilized Man*. Dr. Crile referred to the elements of the nitro group as controlling the behaviour of plants and animals and their general occurrence in protoplasm. Nitrocellulose and other nitro explosives disintegrate all the time except when kept in the dark at 0° temperature. In man, at a temperature of 108°, there is delirium because of an explosive type of decomposition of the brain cells. In the tropics, the brain and thyroid in man are smaller than in the arctics because of the law of explosives. The adrenals were referred to as the energy-control of glands. The following remarks were based on a study of 3,690 animals (Geo. Crile, M. D., Cleveland Clinic Foundation and Daniel P. Quiring, Ph. D., Western Reserve Univ.),—Eskimos have larger brains than other human beings. The male brain is larger than the female in both the tropics and arctics. The heart is larger in the north. The adrenal glands are larger than the thyroid in wild animals but in man, the thyroid is much larger than the adrenals and that is why man is a walking, thinking animal and not a jumping, rushing animal. The adrenal glands of the lion were found to be very large while in the alligator, an animal of about the same body weight, almost nothing. In the lion, the heart, brain and trachea were also much larger. A comparison of two thoroughbred horses, Equipoise and Brown Eyes, both equally well-bred, showed in the case of Equipoise a brain of 880 grams and for Brown Eyes one of 650 grams. The heart in both, about the same, but Brown Eyes could not be started in a race, could not be controlled and, on examining the adrenal glands, those of Brown Eyes, were found to be much larger—too much excitation. The gorilla, depending on an outburst of energy more than the lion, because of its tree life, was found to have a slightly larger thyroid but a much larger adrenal than the lion. In the human, the thyroid and adrenals compare as 2.5 to 1. In the human foetus was found the same pattern as in the gorilla but at 12 years of age, the thyroid and adrenals balance and from then on, the adrenals remain the same and the thyroids rise to the human pattern of 2.5 to 1 for the adrenals, so that for a human 63.6 Kg. there was found a brain of 1198 gms., a thyroid of 22.3 gms. and adrenals of 9.75 gms. The following was submitted without comment,—a gangster, guilty of murder, was found to have a brain of 1310 gms., a thyroid of 31 gms. and adrenal

glands weighing 24 gms. Civilized man has the largest brain and the largest thyroid, the two seemingly to serve as axis partners. The higher the mutation, the higher the capabilities and equipment. The regularity of relationship was found between organ size and metabolism but, in over 800 animals studied, there was found a fundamental relationship between brain and energy,—1 gram of brain is required to execute 12 gms. of energy or heat production in all animals, both warm and cold blooded.

The next speaker was Arlie V. Bock, M. D., of Howard University on the subject: *The Growth and Decline of Intelligence*, and termed a plea for the better understanding of young people. Dr. Bock plans to have a group of 75 men under observation, each year, throughout the 4 years of college and for 20 years after graduation. Records will be kept of the scholastic standing, extra-curricular activities, etc. Each person, prior to being admitted to the group, is examined by a physician, physiologist, psychiatrist and sociologist as to well-being and ability.

Men with less than a 50 per cent chance of success (of graduation) are excluded. The 75 are chosen from a list of 250 submitted by the class and the cooperation of the student is obtained by giving him an opportunity to speak about himself. The investigations are so arranged as to not conflict with the regular activities and schedule. The findings of significance, particularly the effects of divorce courts and environment will be published along with the case histories.

There next followed a talk by George D. Stoddard of the State University of Iowa on *The Growth and Decline of Intelligence*. He stated that the normal child is plastic, grows and changes and dull parentage need not necessarily produce a dull child, especially when children are taken into foster homes of superior environment. This was proven by all case histories made in his studies. The intelligence rating of the child was based on school aptitude and the I. Q. paralleled the school achievement.

The speaker at the Friday noon-day luncheon was Dixon Ryan Fox, President of Union College on the subject *The Independent College and School—Their Necessity*. The independent school and college should, according to the speaker, be regarded as the symbol of independent citizenship. The good quality of American schools, in general he held to be

due to the variation of programs and to competition. The state universities would not be as good as they are if it were not for the competition of private schools. The best source of support for private schools, he stated, is the alumni but it has been found that less than one-half of the 15 per cent income tax exemption is actually given. If capitalism leaves the private school in the lurch, capitalism will be hurting itself. More support must be given, if the private school is to survive. In the absence of adequate support, the private school, since it has been found useful, will be obliged to fall back on state support with the resultant control and dictation by the state and the speaker deplored this possibility.

Wilford M. Aikin, Chairman of the Commission on the Relation of School and College of the Progressive Education Association, presided at the final Friday afternoon session. The first speaker was Burton P. Fowler, Headmaster of Tower Hill School. He presented *An Appraisal of the Eight-Year Study of the Progressive Education Association*. He stated that complete reports from 30 schools (those taking part in the 8 year study) are expected in less than 1 year (the Commission on Relations of Schools and Colleges ends its work December 1941), and that the completed 8 year study will be most timely because of the depression, national crisis, and the need for general overhauling of secondary educational plans. Mere changes, for the sake of changing, have not been the objective. Study of objectives of great value have proved that planned experimentation tends for progress. Only the final report can give the perfect and true picture. A study made, the speaker stated, over a period of 5 years of certain students, as to whether they were aided or hindered by the plan, showed the college grades to be slightly superior to those of a control group. The work of the committee has not harmed the student and the schools and colleges with the greatest innovations made the most remarkable improvement. Graduates of the 30 schools were found to be more certain about their aims and more critical of their high schools. The preparatory school course was not indicative of college success. The students under study were found more active (radio, dancing, hobbies) than those in comparison groups. The magazines preferred were: Life, Reader's Digest, Time, New Yorker. Comparison group students talked about the good courses

they had taken, students of the 30 schools stressed the habits of study they had acquired. Changes should be for national unity, either for defense or reconstruction. The colleges (functioning under the plan) all agree that,—

- a—The eight year study has proved its points.
- b—Standards other than those prescribed should be adopted.
- c—The high school is in a better position to judge the powers of a boy or a girl.
- d—A high school curriculum of more flexibility is emerging.

The speaker concluded that the 8 year study has advanced secondary school education.

Harold E. B. Speight, Executive Secretary, Commission on Teacher Education of the Association of Colleges and Universities of the State of New York was the final speaker of the Conference with *Comments on the Eight-Year Study*. He stated that students of the 30 progressive schools reporting on the plan were at least not hindered while in college. Graduates of progressive schools showed alertness of mind, seriousness of thought and sensitiveness to social needs. In the speaker's opinion freedom allowed during adolescence was not conducive to success in college and later life and that freedom should be permitted as earned. Disappointments of the study were largely due to factors not under the control of the commission, for example,—an extraordinary or abnormal child sent to a progressive school. Many of the formal statements of applicants did not lead to the appraisal of whether the applicant should go to college and whether to a particular college. Civilization that produces individualists is not the ideal, but a civilization producing great individuals is. Teachers (of grammar schools—high schools—colleges) should consider themselves colleagues. Upon the proper answers to the following will depend the improvement of our graduates,—What do the schools need? What are teachers doing to improve themselves? Are the schools achieving what they set out to do? How the student feels and thinks must be found out from the student and from his reactions we must learn.

The entire Conference was well organized and the papers were most interesting. An elaborate exhibit of books, pamphlets and types of examinations was held in the ante-room of the meeting hall. In the opinion of the Conference representative, the members of the American Association of Colleges of Pharmacy would do well to take a greater interest

in the modern thoughts and concepts of educators as presented at such meetings.

Credit is given Mr. Benjamin Milana and Mr. Berl S. Alstodt of the Brooklyn College of Pharmacy for their aid in covering all meetings of the Conference.

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## The Importance of Physical Properties in the Teaching of Pharmacognosy\*

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Because of time, this paper is limited to a discussion of the importance of physical properties of crude drugs in the teaching of pharmacognosy. It does not include a study of the relationship of physical constants to the active principles in a drug.

One may raise the question as to how important the study of physical properties of drugs is to the pharmacy student. As a matter of fact this is determined by the opinion of the instructor and the facilities at hand for the study. If a laboratory is not well equipped for the study of microscopic anatomy and microchemic work, it is probable that more time will be used in making a macroscopic study of physical properties. Time at the disposal of student and instructor is another factor. However if the study of physical properties is important as a means of identification and evaluation of certain crude drugs, sufficient stress should be placed upon the study to enable the student to become familiar with the specific characteristics. This knowledge becomes just as much a working tool as is his knowledge of microscopic structure and chemical constituents.

If time permits, some system like that used by Professor Slama would be of value. The student should become familiar with the terms used in describing fractures, surface markings, odor, taste, internal appearance, shape and color. These terms, if studied in connection with appropriate demonstra-

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\*Read before the Conference of Teachers of Pharmacognosy and Pharmacology at the 1940 meeting at Richmond.

tion material in the preliminary botany course, would save time.

An ideal method in small classes is to quiz each student and determine his ability to recognize the physical properties of the drugs studied. This also shows the instructor the difficulty of trying to establish organoleptic standards in a group of students. While it is impossible for a color-blind person to appreciate colors, or a deaf one, the niceties of fracture sounds, it is often possible to emphasize the other physical properties of a drug that do have diagnostic potentialities so that the handicapped student can recognize a specific drug by its general appearance.

If a sufficient number of demonstrations are made, the average student should soon learn to recognize a drug at a glance. Demonstration material should be selected which is typical and should be placed in the hands of the student so he can observe its diagnostic characteristics while the lecture is in progress and he should make accurate notes stressing characteristics in each specimen.

In the laboratory a number of specimens should be kept in glass jars or piled on the table so the student may observe and handle them and study the variations that occur in different specimens of the same species. Frequent identification tests should be conducted reviewing, especially, those drugs the student has failed to recognize. A drug plant garden offers great possibilities as an outdoor laboratory where the growing plants can be observed in season. When mature they may be collected, cured and compared to those which are obtained through the general trade channels. Students, who have access to garden space, should be urged to grow their own drug plants. The laboratory should be provided with such apparatus as osmoscopes, drying ovens and ultraviolet cases so as to enable the student to carry on his work successfully. Much of the apparatus can be constructed at very low cost. If the instructor is himself enthusiastic and inspiring he may motivate his students so that work which is often looked upon as drudgery will become a real pleasure.

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I am glad to say that we have now reached a point where we are able to work with the army instead of fighting it. I am hopeful that this happy relationship will continue and yield what we want without the necessity of a fight in Congress over bills not approved by the Surgeon General. Winning on this latter basis is like invading England.—H. Evert Kendig, President.



## Latin in Prescription Writing\*

ELMER M. PLEIN

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This paper is being written to present facts concerning Pharmaceutical-Latin terms and abbreviations collected from the prescriptions representing a year's business of a pharmacy located in a western state. These terms were obtained from 1027 original prescriptions filled between July 1, 1938 and July 1, 1939. Of these 1027 prescriptions 340 were received by telephone and carried the terms and abbreviations of the pharmacists. The remaining 687 prescriptions were written by 152 physicians and dentists. Twenty-nine of these doctors practice within the city; 95 of them out of the city, but within the state; and 28 of them out of the state.

Latin has been used as the language of the prescription because it is the language of scientific nomenclature and is used in the sciences in general; it is a dead language and less likely to be altered than are the modern languages; it is a universal language and Latin terms are definite whereas vernacular names of drugs are characteristic of certain localities; it is used to conceal from the patient the nature of the drug or the disease which that drug is to treat; and it is the language of official nomenclature. The latter reason requires some discussion. The market is constantly being flooded with a stream of proprietary preparations which possess strange titles incapable of Latinization. The physician, though he wishes to write his prescription in Latin, is confronted with English titles for the inscription of his prescription and continues that language for the remainder of his order. In these 1027 prescriptions, 218 proprietary preparations and unofficial drugs were prescribed and 204 official preparations and drugs were ordered. Only five prescriptions were written completely in Latin, 257 were made up of a mixture of Latin and English, and the remaining 765 were written in English completely.

Five different physicians were responsible for the five prescriptions written entirely in Latin and three of these prescriptions were correctly written. There were no mis-

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\*Read before the Conference of Teachers of Pharmacy at the 1940 meeting at Richmond.

spelled words among those written out in full, each word having its proper ending according to grammatical construction. True, these three prescriptions each contained several abbreviations, but they were all accepted Latin abbreviations. Of the remaining two prescriptions, one contained two misspelled words because of improper endings. The fifth prescription had in it five errors,—three through the improper use of case endings of nouns, and two through the use of abbreviations which are not generally accepted.

It is an easy matter to translate the Latin terms and abbreviations appearing on these prescriptions. After a short time in contact with the terms, one recognizes them at a glance. In order to be able to tell why the various terms possess their particular grammatical constructions is quite another story. One must have a knowledge of the declensions of nouns and adjectives, conjugations of verbs, uses of prepositions, and occasionally idiomatic expressions. To have a thorough knowledge of the uses of the nouns and adjectives and their abbreviations appearing on these prescriptions, one would be required to know the following points concerning grammatical constructions in Latin words:

|            | Singular   | Plural   |
|------------|------------|----------|
| Nominative | 1*, 3*     | 1, 3     |
| Genitive   | 1, 2, 3, 4 |          |
| Accusative | 1, 2, 3, 5 | 1*, 2, 3 |
| Ablative   | 1, 2, 5    |          |

This table shows how the five declensions of nouns and adjectives are represented with respect to case endings required, the numbers in the table designating the numbers of the declensions. Thus only eighteen of the forty possibilities would actually be necessary to write these prescriptions using Latin words written out in full. However, upon examination of the list of words prepared in this survey, one finds only six of the endings properly used. These six are designated in the table by the italicized numbers. In addition to these six the physicians used four others incorrectly. Three of the four incorrect endings are shown in the table by means of the asterisks, the fourth one being second declension singular.

The prepositions *ad*, *ante*, *in*, and *post*, governing the accusative case; and *cum*, *in*, and *pro*, governing the ablative case were used. Only *ad*, *cum*, and *in* were written out, whereas the others were abbreviated. The abbreviations of three

adverbs, *bis*, *ter*, and *quater*, appeared on the prescriptions one or more times. One conjunction, *et*, and the abbreviation of one indeclinable word, *ana*, appeared in the prescriptions. Only nine verbs, representing the first three conjugations were employed, five of them in the imperative mood and four in the subjunctive mood. Of these nine only three were written out (*fiat*, *misce*, and *mitte*) and the remaining ones were abbreviated.

A further study of the list of words reveals that there are 100 Latin words in it with seventy of them correctly written with the proper endings according to usage in the prescription from which they were taken. Twenty-six of the errors were due to wrong case endings and four to misspelling. There are 160 abbreviations in the list and 103 of these are correctly spelled.

Mention was made of the fact that 340 prescriptions were received by telephone and carried the terms and abbreviations of the pharmacists to whom they were dictated. The discussion thus far has dealt with the words for which the physicians and dentists were responsible. It is interesting to note how many Latin words the pharmacists used in taking dictation. They used eighteen words with seven of them correctly spelled (nine errors were due to wrong case endings and two to misspelling) and 78 abbreviations of which 53 were correct. The physicians made use of all the Latin words the pharmacists used, but the pharmacists used two abbreviations correctly and five incorrectly which the physicians did not use.

A separate list of 46 additional abbreviations and misspelled words was prepared which were purely English and showed definitely that there was no attempt on the part of the physician or dentist writing the prescription to write Latin. In this list we find ten chemical symbols, two abbreviations denoting commercial companies, and five misspelled words, e. g., *Epicac* and *Cocallina*. The remaining 29 were abbreviations formed for the most part by shortening the words which they represented, e. g., *ev.* for every, *dir.* for directed, *d.* for drop, and *nec.* for necessary. The pharmacists used thirteen of the same abbreviations and ten of their own, but they misspelled no words.

It would certainly appear from the facts here presented that a separate course in Pharmaceutical Latin is not neces-

sary in order to teach the student the Latin terms and constructions he need know to fill the average prescription. However, a considerable amount of Latin should be taught the student, which teaching can be very adequately done in the course in dispensing pharmacy.

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## The Skilled Hands of the Pharmacist\*

MRS. RALPH BIENFANG

School of Pharmacy, University of Oklahoma

As Aesop puts it, "Our greatest blessings are often the least appreciated." Sometimes I wonder if this is not the case of the American people and the pharmacist. Is it not true that the public has been served so adequately and so competently by the registered pharmacists of the nation that an appreciation of the important role played by them in everyday community life is sometimes lacking. They practice their profession with such deftness and surety that it seems as though it could be done by anyone. This, however, is hardly true. Their slightest move is the result of patient education steadied by years of tempering experience. The next time you go into a drug store, I wish you would pay particular attention to the hands of the registered pharmacist. He has, in common with other professional people, musicians, artists, and surgeons, hands which are skilled in his calling, hands which command respect.

Steadiness in these hands is just an expected fundamental. I have heard it said in a joking way that a pharmacist could pour drops from a barrel. From his long experience with and the necessity of his being able to control and handle liquids of various characters, it would not surprise me to hear that one of them could actually accomplish this feat. Seriously, of course, liquids are ordinarily handled in much smaller and much more convenient containers, but both stock bottles and prescription bottles still have lips, and some of these can be as unpredictable as a dime store cream pitcher. No, the capable handling of liquids from stock bottle to prescription

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\*Read before the Women's Auxiliary of the Oklahoma Pharmaceutical Association at the 1940 meeting.

bottle without waste or loss of time does not lie within just anyone's ability.

Many liquids used in prescriptions are similar in color and appearance but have different densities. This causes a difference in apparent weight to the experienced hand. Where one of us might make a mistake of choice due to similarity of appearance, the pharmacist's practiced hand would immediately detect a difference from the expected apparent weight. You may say, "Yes, but everything is properly and accurately labelled in the well-regulated pharmacy." What if through some error on the outside, something should come into the store incorrectly labelled? Irrespective of this, however, it is reassuring to know that this skill enters into the handling of even routine items.

Did you ever stop to think of what the pharmacist is called upon to handle over and over again in his professional day? Prescription bottles, graduates, stirring rods, and many other articles made of glass, fuming acids, and other corrosive liquids, and a delicate set of balances with exceedingly small weights. Here skill goes without saying, for the slightest awkwardness or lack of skill would result in broken glass and other dangerous and costly wastes, acid holes in clothing and flooring, and corroded or even wrecked balances.

As an indication of the pharmacist's professional skill and deftness, he has for centuries been preeminent in the wrapping of small odd shaped packages neatly and compactly. A tradition with registered men, this skill is still much in evidence at the wrapping counters of our many pharmacies.

Frequently microchemistry, the handling of chemical substances in small amounts, is spoken of as a new departure in scientific fields. And praise has been directed at individuals who have successfully developed qualitative or quantitative tests which involve only these small amounts. What would you say the pharmacist had been doing all these years in handling potent drugs with doses of  $1/60$ ,  $1/100$ , or even  $1/400$  of a grain? And the results of his manipulations do not simply add to the scientific literature but take a vital place in saving a life or contributing to the health of a fellow human being! As a matter of fact, the pharmacist has long been a microchemist, and has never considered this phase of his skill to be particularly outstanding. It is nevertheless an evidence of skilled hands.

The physician, the nurse, and the patient all require that a finished prescription be perfect in appearance from every point of view. It must be neat and clean, must all be contained within the package regardless of viscosity or fineness, must be of just the proper color or tint (and just the same shade of color if it is a refill), must have its label adhering completely and on absolutely straight, and must have its directions written in a faultless hand of unquestioned legibility. And though all of these conditions are executed perfectly, the pharmacist, unlike the artist, cannot sit back and wait for praise occasioned by its psychological or esthetic effect. Or unlike the surgeon, cannot expect and count on the subsequent beneficent aid of biological forces. No, this prescription is to be taken by a human being and must and will have a physiological and therapeutic effect. Unlike a painting, errors cannot be painted out or glossed over, and unlike a surgical operation, no natural forces, with a few exceptions, will later come to its aid. There can be no error in its compounding! Does this call for skilled hands?

Many little manipulations like filling capsules, making a dozen pills, triturating an emulsion, homogenizing an ointment, or folding powder papers seem so easy in the skilled hands of the pharmacist, that it might appear that they could be done by anyone. Believe me when I say that a layman would soon be calling for help. A drug magazine expressed this rather effectively some time ago. A customer was objecting to the cost of a prescription on the basis of his knowledge of the cost of the ingredients. "All right", the pharmacist said, "I'll sell you the separate drugs at a fair retail price and you can mix them yourself." What did the customer do? What would any intelligent person do?

In the skilled hands of the pharmacist lie the well-being, the health, and sometimes the lives of those who come to him. They come in confidence by virtue of his skill. His reward is not his name in headlines, a medal, or an honorary membership in a learned academy. His satisfaction lies in the trust placed in him by the men and women, and the boys and girls he serves.

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It is fatal to advertise and not have the item in stock; and that is just as true of soliciting professional patronage for service one is not prepared to furnish.—Edward Spease.



## Hospital Pharmacy---Its Organization, Its Service, Its Problems and Its Plans\*

EDWARD SPEASE

Director Professional Relations, National Association of Retail Druggists

The invitation to address you is greatly appreciated by me personally and I think was no less welcomed by the organization which I represent, the National Association of Retail Druggists. I have found in my short connection with the Association and my long friendship with its Executive Secretary, Mr. John W. Dargavel, that he is always alert to and anxious to help with any movement that is designed for the best interests of pharmacy and especially that part which is concerned with the welfare of the retail druggists. In accepting the new position, and new title of Director of Professional Relations, with the National Association of Retail Druggists, I was fearful that for a time I might lose my close contact with the hospital pharmacists of the country, though very many of them I count as my closest personal friends.

I hope to show before completing this talk that instead of losing interest in hospital pharmacy, and losing interest in you, quite on the contrary, I am more interested than ever, and that you are essential to the success of this new phase of my endeavors and that because of the great resources of the organization with which I am connected, I can make more personal contacts with you and be of more help to you than ever before. In the past my activities were much limited by the small amount of my own personal income that was available for this work.

In my present position I like to think of the renaissance of hospital pharmacy as parallel to and concurrent with that of an interest in professional pharmacy and the revitalizing of the work of the National Association of Retail Druggists, after Mr. Dargavel took over its leadership years ago. Activity in hospital pharmacy has been almost entirely during the last ten years, and much of this has occurred during the past six, which is likewise true of the growth and development of the National Association.

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\*Read before the Wisconsin Hospital Pharmacists at the University of Wisconsin, November 9, 1940, and printed in this journal at the request of the Editor.

For the benefit of some of you who may be comparatively new in this field, let me sketch briefly what has happened, but before doing so, I should like to pay tribute to a few of those hospital pharmacists who were on the firing line and did much for the advancement of pharmacy but who are not, as in all movements, given the credit they deserve for the work they have done. I refer to William Gray of the Presbyterian Hospital and Irwin Becker of the Michael Reese Hospital, in Chicago; Ivor Griffith of Philadelphia; Edward Swallow, deceased, of New York; and Ray Barthalow of Columbus, Ohio, and the many others whom I do not know, yet who recognized that a high regard for professional pharmacy must be had by hospitals if it is to be so regarded nationally by the general public. I was in constant contact with the work and writings of these men for many years and can truly state that it was inspiration created by them that started the activities which to my mind have not only enabled hospital pharmacy to become recognized but did contribute in no small way to the interest in professional pharmacy and the success of many pharmacy departments in the better drug stores of today.

After several years of hard work and daily observation in the hospitals, together with frequent conferences with physician and druggist friends, we launched in 1931 our program in Cleveland. It consisted at first in the writing and acceptance of an agreement between the hospitals and the university. This agreement provided that the pharmacy staff become members of the teaching staff of the university, that the professor of pharmacy be the directing pharmacist of the hospitals, that the school of pharmacy have control of pharmaceutical research, that a pharmacy committee be created, consisting of a representative from surgery, as chairman, two from medicine, one from pediatrics, one from obstetrics and gynecology, the directing pharmacist and the pharmacist. This committee has charge of the pharmacy, its operation, the addition to and deletion from its stock, and in the same manner has charge of professional stores. This naturally led to the development and the placing in writing of a drug policy and a professional stores policy. (Copies of both are available.)

The drug policy is, in short, that nothing but U. S. P., N. F., and a chosen list from N. N. R., drugs be stocked in the hospital and be furnished upon the flat rate system. Provision was made for study of new drugs and research upon new

products. Drugs outside of the policy could be obtained for patients of a visiting physician from an outside drug store and the patient charged accordingly therefor. In such a case, however, the visiting physician is to be informed of the drug in stock which a staff member would use. This policy led to the establishment of a rational therapy within the hospital, which is a teaching hospital, and to the setting up by the school of a manufacturing laboratory where pharmaceuticals and their compounds could be produced. Likewise, it led to the establishment in the school of a control laboratory for the analysis of and study of products used within the hospitals and to the development of the teaching of hospital pharmacy and even attracted numbers of graduate students to this field. It placed members of the teaching staff of the department of pharmacy upon the faculty of the graduate school of the university and thus recognized pharmacy, not alone pharmaceutical chemistry, as worthy of recognition as graduate work. It led to the establishment of resident pharmaceutical internships, in some hospitals for one year and in others for two years and to the creation of a hospital formulary based upon rational therapeutics. While some formularies before this have been in existence for many long years in our older hospitals, there has been a great spread of this idea and many revisions of older ones have been made and many new ones have been created, all returning to U. S. P., N. F., and N. N. R., to such a degree as the medical men using them could understand and appreciate true rational therapy. No manufacturer who possessed a true research laboratory was ever refused a hearing upon a new product nor an opportunity to submit clinical evidence. Eight annual reports of the activities of the pharmacy, the school laboratories and the pharmacy committee were prepared and submitted to the director of the hospitals. These policies led to the establishment of a repair shop in connection with professional stores where marked savings have been made.

We were invited to submit a paper upon our activities embodying a set of minimum standards for hospital pharmacies at the Eighteenth Annual Hospital Standardization Conference of the American College of Surgeons in San Francisco in October 1935. This paper was published in the Bulletin of the American College of Surgeons in March 1936 and the Approval Number of October 1936 shows the final adoption of

the standards. This was the stimulus that pharmacy needed which was brought about by the keen insight and sympathetic understanding of Dr. Malcolm T. MacEachern of the College of Surgeons and, is, to my mind, of everlasting benefit to the hospitals, as well as one of the finest things done by any branch of the medical profession for pharmacy. From this time on there has been intense and renewed activity in many places and by many persons, not alone in hospital pharmacy, but in all forms of endeavor in the field of professional pharmacy.

An admirable report came from the Committee on Pharmacy of the American Hospital Association in 1937 and this and the papers and activities of its hospital pharmacy section may be found in its Annual Transactions up to and including 1939. A pharmacy section has now been running in Modern Hospital for a number of years and I am asked to prepare the material for its year book, now on the press. Many state and local organizations of hospital pharmacists have come into being, some being integral parts of hospital associations. Many schools and colleges are beginning to be active in this field. Many hospitals are installing pharmacies and employing pharmacists and many are officially calling in the services of nearby pharmacies, for eventually all hospitals "must have pharmaceutical service". Schedules have appeared for internship training.

Organized research upon both old and new drugs is being conducted both by schools and by hospital pharmacists. The American Pharmaceutical Association has established a subsection. Nearly every hospital and pharmaceutical publication contains papers upon some phase of hospital pharmacy and some are just beginning to see where it all ties into the field of pharmacy itself.

Before completing my thesis I want to point out a few things that may serve as suggestions both to hospital pharmacists and to administrators. It is not necessary to adopt my program, as I have outlined it. It will not fit some types of hospitals but it can be and has been adapted to the needs of many. Administrators will be interested in monetary savings, and most of them are enough interested in the patients to recognize the professional service due them. Where it is the style to have a central dressing room, the connection between its service and that of the pharmacy should be studied. The service a pharmacist can render as a drug and professional

stores buyer should not be overlooked, whether the pharmacist is a resident one or one in a nearby pharmacy. In large hospitals where a buyer is employed, the pharmacist should create standards and specifications. The manufacture of pharmaceuticals, parenteral and other sterile solutions, the newer ointments and ophthalmological preparations are worthy of notice. They will stop pouring silver from X-ray down the sewer if they consult the pharmacist. Surgical soap and other soaps and cleansing materials need study.

If I were an administrator, I should see to it that my pharmacist not only had time for but actually attended one or two pharmaceutical meetings each year and showed progress enough to get out one paper worthy of publication somewhere. If he does this, then he should be remunerated for his expenses to at least one convention—or, facetiously, to one-fifth as many as the administrator himself attends. In small hospitals, now, the pharmacist sometimes is both buyer and storekeeper, in some he is an assistant administrator, in others he is in charge of the out-patient department, or he may be in charge of certain laboratory work and in some X-ray. I am deeply impressed by several connections made with outside pharmacies, where the pharmacist is sufficiently progressive to see the service he can render. In addition to this service I also envisage the bringing to practicing physicians and to their patients the same service outside the hospital that they can receive inside it.

I am not an exponent either of socialized medicine or pharmacy and do not believe that the best service can be rendered where individuality is stifled. The hospital pharmacist and the drug store pharmacist can learn much by visiting each other in as many stores and hospitals as they can visit in any one year. Do not become too lazy and self-centered to go out and visit occasionally. While upon the subject of visits, let me call the attention of hospital pharmacists to the fact that they, too, must visit or have professional conferences with, or "detail", if you please, the physicians of their own world. This must be done both inside and outside of the hospital. If you are progressive you will want to do this and you will find subject matter enough in one day for any number of visits. Do not visit just those who are practicing internal medicine, but go to all the departments. Go once in awhile for a purely social chat. When you know medical men and hospital depart-

ment heads and others well enough to do this, you soon find where you can be of service. The technique of visits is the same for you as for the successful professionally-minded retail druggist. Both practicing pharmacist and hospital pharmacist need to learn medical terminology.

My present position is one of Professional Relations. It is my duty to make contacts with physicians, dentists, pharmacists, hospitals and every branch of the public health field and endeavor to create friendships and cordial relations between them. You, as hospital pharmacists, can help me mightily by doing your own job well and to do this you must be familiar with what is going on in your own field as well as in that of others. Human knowledge is so broad that no one person can keep completely up to date. Let me know of the new things which you learn and do from day to day. Let me publish them so others may learn. Let me send you information as I gather it upon new subjects through our Journal. Perhaps I can help, too, upon special problems from time to time. Perhaps I can call upon you to help solve a problem for some one else.

Your potential status in the National Association of Retail Druggists is exactly what mine is. You can be an associate member. You, or better, your hospital, can subscribe for the Journal. Maybe you have a better suggestion. It is an organization composed of nearly 30,000 retail druggists, no chain stores, nothing but retail druggists. I feel sure that we can be helpful one to another, otherwise I would not have been here today.

Let me return one moment to the subject of papers which you may write. If it be in conjunction with a medical man, and some of our pharmacists are doing collaborative work, it should be published in a medical magazine, of course, depending upon subject matter. If it be of pure scientific pharmaceutical research it goes in the Journal of the A. Ph. A., if it be of interest to hospitals from an administrative or purely hospital pharmacy viewpoint, it belongs in a hospital magazine, and if it be of a nature that will be of interest to and of service to the practicing pharmacist in the retail drug store, it belongs in the N. A. R. D. Journal. I feel sure that our Editor, Mr. George A. Bender, will be glad to open his columns to you for this type of material.

It is quite pleasing to know that the Director and other



members of the pharmacy faculty of Wisconsin are making it possible for you to work with them and that they in turn are interested in you. You, as hospital pharmacists, need the facilities of the school, if you are at all progressive, and they, too, for the same reasons, need you. The same cooperation should be, and doubtless is, extended to all retail druggists.

In conclusion, may I add that the National Association of Retail Druggists and I, as its Director of Professional Relations, will be happy to render any service we can to you and will in turn be appreciative of any interest which you may take in us.

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## The Financial Support of Pharmaceutical Education and Research\*

ERNEST LITTLE

Chairman of the Committee on Endowment of the  
National Drug Trade Conference

The Committee on Endowment for the colleges of pharmacy appointed by the National Drug Trade Conference is making an effort to survey the financial needs of the colleges of pharmacy within the United States, with the hope that those who have derived their fortunes from pharmacy may be induced to make pharmaceutical education and research a beneficiary. For several years the Committee has made continuous but slow progress. One of the reasons why more rapid progress has not been made is that it has required some time for the members of the Drug Trade Conference to de-

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\*This paper is the report given at the 1940 meeting of the National Drug Trade Conference. The personnel of the Committee and the organizations they represent is as follows: S. B. Penick, American Drug Manufacturers' Association; George D. Beal, American Pharmaceutical Association; Harry Noonan, American Pharmaceutical Manufacturers' Association; David L. Maxwell, Federal Wholesale Druggists' Association; Robert L. Swain, National Association of Boards of Pharmacy; Rowland Jones, Jr., The National Association of Retail Druggists; E. L. Newcomb, National Wholesale Druggists' Association; J. F. Hoge, The Proprietary Association; and Ernest Little, Chairman, American Association of Colleges of Pharmacy. Since this study deals with a problem of major importance to pharmaceutical education, it is printed here in its entirety.—Editor.

termine, even approximately, what kind of a program should be adopted and presented to those individuals from whom financial aid is expected. Mr. Carson P. Frailey, President of the Conference, has shown a fine interest in the work of the Committee and he expressed the hope that the report submitted at the December meeting might be complete enough to result in the adoption of such a policy and program as may seem appropriate. To that end, the Committee sought certain basic information which it might use statistically but hold confidential as to origin. To obtain this information, early in October of last year, a letter and a questionnaire was sent to the dean of every college of pharmacy in the United States.

Most of our colleges responded with reasonable promptness. A few were negligent, and a second letter was sent to them on November 2, urging that the questionnaire be filled out and returned with a minimum of delay. To date, 58 of the 74 questionnaires mailed on October 12 have been returned.

Three deans who failed to return the questionnaires acknowledged the receipt of the same and furnished some information by way of letters. One college which is not on the accredited list of the American Council on Pharmaceutical Education refused to accept the letter containing the questionnaire. A second attempt on our part met with the same result. We were a bit puzzled by this attitude until one of the Chairman's colleagues very considerably pointed out to him that the name and address of the New Jersey College of Pharmacy was printed on the upper left hand corner of the envelope and that the dean who refused to receive the letter addressed to him might have been familiar with the disposition of the dean at the college from which the letter was sent. One can hardly feel complimented by such a comment, but, after all, it is little pleasantries of that sort which make life easier, less monotonous, and altogether more enjoyable.

The dean of another non-accredited college wrote a very cordial letter and explained that he was not returning the questionnaire because he felt that pharmaceutical education had advanced to a point where his school could no longer make any worthy contribution to the program and was, therefore, closing its doors. Accepting this letter at its face value, we feel it was one of the finest replies received and certainly did not contain unwelcome information.

With your permission we shall read the questions contained in the questionnaire, which was approved by the Committee, and comment briefly on the replies received.

*Question No. 1*

Question No. 1 was stated as follows:

"Would you welcome financial aid from the manufacturers and distributors of medicinal products for the college of pharmacy of which you are dean?"

Fifty-seven of the replies received in answer to this question were in the affirmative and 1 in the negative. Many of the affirmative replies were qualified somewhat as follows: "*I would welcome financial aid from reliable, reputable concerns*" or "*if given with no strings attached*."

Whether or not you men agree with these statements, we believe that you are not greatly concerned by them because all of you feel that you are representatives of reliable concerns of good reputation.

The Committee is not too much impressed by the "*no strings attached*" sentiment. Some of the finest and most useful gifts to educational institutions have had very definite strings attached. The important point is that whatever strings may be attached are exerting their pull in the right direction, or merely making certain that the money is being properly spent for the purpose for which it was intended.

One dean commented as follows: "*We would welcome financial aid from any source other than Hitler*." At first we were rather favorably impressed by that reply, but our later reaction was, "*Why rule out Hitler?*" Are there any among us who could not spend his money to better advantage than he is spending it at the present time? Is not that the real question involved?

We are of the opinion that if the administrators of a college are possessed of the strength and character which men in their positions should have, too much concern need not be felt as to the source of the money which they are using for worthy purposes. We are further of the opinion that a college presided over by administrators who are not possessed of such qualities is not likely to render a worthy service even though it may be financed by a such a reputable institution as the Presbyterian Church.

Is it not also true that if any development such as we are hoping for is to succeed, we must go along together in a rea-

sonable spirit of mutual confidence? One should not be too critical, but we do feel that a little more confidence in the other fellow and a little less satisfaction with our own virtues may form a solid foundation upon which a structure of great usefulness to pharmacy may be erected.

*Question No. 2*

Question No. 2 inquired whether or not the college received financial aid from the state in which it is located, and, if so, how much on an average per year.

Of the replies received in answer to this question 30 were in the affirmative, indicating that state aid is available, and 11 were in the negative.

Six colleges indicated that they received from \$1,000 to \$10,000 a year, 7 from \$10,000 to \$20,000, 5 from \$20,000 to \$30,000, 1 from \$30,000 to \$40,000, 1 from \$40,000 to \$50,000, and 1 above \$50,000. Some colleges answered that they were entirely state-supported without giving their specific appropriations. Other colleges gave the appropriation for the whole university without indicating how much of such appropriation was available for pharmacy. Time did not permit further letters of inquiry to straighten out such matters, which accounts for the relatively small number of tabulated replies. Much more complete data is, of course, available in the questionnaires.

While the situation as to state aid for colleges of pharmacy is not too discouraging, it should be improved. We are of the opinion that the Drug Trade Conference, through its members in every state in the union, could prove helpful in promoting state aid for pharmaceutical education if the colleges will take the initiative and request such assistance.

*Question No. 3*

Question No. 3 was worded as follows:

"Do you have sources other than state aid to supplement your income from tuition fees? If so, please give the approximate amount and state whether or not it is likely to continue."

Eighteen colleges indicated that they had sources of income other than state aid and tuition fees, and 38 colleges indicated that no such additional sources of income were available.

Two colleges indicated such incomes amounting to less than \$1,000 per year, 1 from \$1,000 to \$2,000, 1 from \$2,000

to \$3,000, 2 of \$5,000, 2 between \$9,000 and \$10,000, 1 of \$15,000, 1 of \$20,000, 1 of \$25,000, and 1 of \$50,000.

Here again many university colleges reported inability to determine what portion of such university funds was made available to the college of pharmacy. Several of those reporting affirmatively on this question indicated that such income was both variable and uncertain.

The data furnished in answer to question No. 3 should prove helpful to any group undertaking to increase the financial support of pharmaceutical education.

#### *Question No. 4*

Question No. 4 asked for in-state and out-of-state tuition fees.

For residents of the state in which the college is located, 1 college indicated no tuition, 8 gave tuition rates of less than \$100, 24 between \$100 and \$200, 15 between \$200 and \$300, 6 between \$300 and \$400, and 2 between \$400 and \$500.

Out-of-state students generally paid higher tuition rates, especially in the \$200 to \$300 group. The fact that approximately 60 of the colleges reporting gave resident tuition rates of less than \$200 a year indicates quite clearly that pharmacy students are not being overcharged for their education.

There is a correlation between the data given in Questions 2 and 4 which has not been established in this report. It can, however, be easily determined from the data given in the questionnaires.

#### *Question No. 5*

The annual income from endowment is asked for in question No. 5. Forty-six colleges indicated no income from endowments, whereas 12 stated that such income was available. Of those answering in the affirmative 6 indicated an income of less than \$5,000 a year, 2 between \$5,000 and \$6,000, and 1 of \$20,000, which is probably the whole university income from endowment rather than for the college of pharmacy alone. One fortunate college reported an income of \$50,000 from endowment. This college stands as a splendid monument to a man who had made his fortune by marketing his products through retail pharmacy outlets and who wished to show his appreciation in a substantial and helpful manner. We all agree that this gentleman of vision succeeded in his endeavor and will always be remembered as a real benefactor of a worthy cause.

*Question No. 6*

Question No. 6 was stated as follows:

"What is the average amount of your operating income received in the form of gifts, that is, sources other than tuition fees, government support, or income from endowment?"

Thirteen colleges indicated some income from gifts. Forty-four reported no such income. Four colleges reported this income as amounting to less than \$1,000, 2 between \$1,000 and \$2,000, 1 between \$2,000 and \$4,000, and 4 in excess of \$5,000.

When you consider the large amount of money which is contributed each year for collegiate education, is it not surprising that colleges of pharmacy should have received so little? The need for such support is real and pressing. Pharmaceutical manufacturing concerns are among the more prosperous units of the manufacturing field. We hope that the National Drug Trade Conference will take the initiative in bringing about an improvement in the conditions reflected in the answers to question No. 6. We believe that the manufacturers of medicinal products are interested in the colleges whose graduates help to man their factories and who are also very largely responsible for the sale of their products.

*Question No. 7*

This question asks what percentage of the student's education is covered by his tuition fees.

Fifty-six colleges reported. One reports 0 per cent, 2 between 1 and 10, 9 between 10 and 30, 12 between 30 and 50, 2 between 50 and 60, 12 between 60 and 80, 4 between 80 and 90, and 14 from 90 to 100. Twenty-one per cent of the students in the 56 colleges reporting pay from 30 to 50 per cent of the cost of their education, 21 pay from 60 to 80, and 25 pay from 90 to 100.

We are unable to accurately give you the relationship existing between these data and comparable data from other professional or non-professional colleges. We are quite definitely of the opinion, however, that the pharmacy college student pays a higher percentage of the cost of education than do students in other colleges.

*Question No. 8*

"How much income per year, in addition to that now available, do you feel you should have in order to carry on a thoroughly adequate educational program in a satisfactory manner?"



Forty colleges answered this question in such a way that we could use it in tabulated form.

Nine indicated the need of less than \$5,000 a year in addition to the money now available in order to satisfactorily carry out an adequate program. Twelve indicated a need of between \$5,000 and \$10,000, 14 between \$10,000 and \$20,000, 3 between \$20,000 and \$30,000, and 2 of \$75,000 a year.

We were somewhat surprised that there was not an even greater spread in the estimates submitted. Sixty-five per cent of the deans reporting felt this need to be from \$5,000 to \$20,000 a year. Few seemed even tolerably satisfied with their present program, and fewer still requested what might be considered to be prohibitive amounts.

It is our opinion that the answers to question No. 8 should be of unusual help to anyone who is contemplating contributions to colleges of pharmacy.

*Question No. 9*

Question No. 9 deals with graduate work and is worded as follows:

"(a) How many graduate students do you have enrolled in your college?"

"(b) What per cent of your graduates pursue graduate work in your college or other colleges?"

Of the 19 colleges indicating that they conduct a graduate program, 10 reported less than 10 graduate students, 5 from 10 to 20, 3 from 20 to 30, and 1 reported a number which is so excessive that we have omitted it from the report.

In their answers to 9b, 12 colleges reported that less than 5 per cent of their graduates pursued graduate work. Fourteen gave the percentage as between 5 and 10, 8 between 10 and 15, 2 between 15 and 20, and 1 between 20 and 25. The Committee would like to see more sound graduate programs in our colleges of pharmacy. There is no doubt that pharmaceutical industry could advantageously use more men of complete graduate training who have done their undergraduate work in the field of pharmacy. It is hoped, however, that no college will attempt graduate work until it is clearly in a position to do a creditable job. There are few things more regrettable in the field of education than shabby graduate work. It is the opinion of the Committee that pharmaceutical industry should more adequately support research and graduate work in such colleges of pharmacy as give promise of carrying on work of high quality.

*Question No. 10*

The answers to question No. 10, taken at face value, are most encouraging. The question asks how many staff members are engaged in research or directing the research of others. Three colleges answered none. Thirty-four estimated that less than 5 of their staff members were so engaged, 13 estimated from 5 to 10, 1 from 10 to 15, and 1 stated that from 20 to 25 of its staff members were engaged in research activities. Three colleges stated that all of their staff members were carrying on research without mentioning the number, as the question requested. The Committee is encouraged by these data. It is probably true that wide variations in the quality of research conducted in the various colleges does exist. It is even possible that no definition as to what constitutes scientific research could be agreed upon. Nevertheless, the fact remains that a big percentage of our pharmacy college staff members are interested in research. They recognize its importance and in their own way are carrying on what they consider to be a worthy research program. Certainly this interest should be encouraged and supported by those who feel they may be in a position to do so.

*Questions Nos. 11 and 12*

We shall not spend too much time discussing the answers to these two questions because we feel they were poorly worded and in some instances misunderstood.

Question No. 11 was worded as follows:

"Do you feel that manufacturers and distributors of medicinal products should attempt to allocate funds to various colleges on a basis of a survey such as this, or should this be left to individual appeals from the various colleges?"

In answering this question, 34 colleges expressed themselves as feeling that manufacturers and distributors of medicinal products should, on a basis of a survey, which in many cases would entail personal inspections, allocate funds to individual colleges. On the other hand, fifteen felt that this should be left to appeals by individual colleges to such persons or manufacturing concerns as they felt might be interested in supporting their program. Five felt that both plans might be used to good advantage.

Question No. 12 was very similar to question No. 11, but dealt with support of special needs and special research

projects instead of general help, as was the case in question No. 11. In answering this question, 35 colleges favored what might be referred to as the allocation plan, whereas 14 expressed themselves in favor of individual appeals to individual concerns. Five again felt that both plans might be advantageously used.

The Committee feels that answers to these two questions prove rather conclusively that a large per cent of college deans favor the collective support of various pharmacy college projects. It is true, however, that a few deans definitely favored what might be called the method of individual appeal.

*Question No. 13*

This question requested the deans to outline any special needs or research projects which they would like to have financed by such manufacturers or distributors of medicinal products as might feel disposed to do so.

Twenty-seven deans spoke of necessary additions to their college staffs, 26 emphasized the necessity of salary increases, 13 were in need of additional clerical help, 30 spoke of the need of increasing their library facilities, 36 stressed the need of additional supplies and equipment, 32 mentioned and outlined research projects which they would like to have supported, 21 spoke of building needs, and 10 asked for increased funds for building operation and maintenance.

If the problem of financial aid for colleges of pharmacy is gone ahead with, as the Committee hopes it may be, the answers to question No. 13 will be found most helpful. They rather accurately portray conditions now existing in our colleges. They indicate what our deans and faculty members are thinking about, what they consider to be their most urgent needs, and the help which they feel they should have to adequately meet them.

There are many special comments to be found in these questionnaires which we would like to call to your attention, but, unfortunately, time will not permit. May we offer a few which seem especially significant?

One dean comments as follows:

"We have run quite successfully on student fees, but only because members of our staff have been willing to accept remuneration far below what they deserve and because we have got along without much needed clerical help. The dean, for instance, has never had a secretary, and what clerical help he needs is obtained from a part-time secretary in

the registrar's office. In most instances the salaries of faculty members are considerably below those for the same rank in other colleges."

This statement presents a need which is real and not imaginary and is typical of the unfortunate conditions existing in many colleges.

The dean of a highly reputable college of pharmacy writes:

"At least a half-time stenographer is needed to relieve professors of much routine work and correspondence. At the present time this is all done by them personally."

How fine it would be if these faculty members could be relieved of such routine work and devote their time to more constructive matters!

This same dean continues:

"We should have money to collect native plants having medicinal possibilities and to investigate them. For this purpose we have a medicinal plant garden of thirteen acres which has been in operation for about fifteen years. This has already shown results."

We can well imagine that some of you men in attendance today would be quite willing to support such a worthy project.

Another comment of interest to the committee is as follows:

"I do not believe that the question of allotting funds should be left until there are individual appeals. I feel that if the greatest good is to be accomplished, a committee should be appointed to investigate how different colleges in different sections of the country might be assisted. It might be well if a plan similar to the Carnegie Foundation could be adopted and the grants made, not on a basis of the present physical equipment of the respective colleges, nor on the present instructional staff, and definitely not on the initiative of the individual members of the instructional staff, but to the colleges which would be interested in developing their facilities and cooperating in a well organized plan of research. These colleges could receive recognition and assistance from the committee, which would ascertain, after an inspection and interview, the sincerity and the willingness of the college to participate."

This comment was written by a thoughtful, capable dean. It was hurriedly constructed and none too well expressed. We present it to you to indicate that this man has done some thinking along the lines of the problem we are discussing.

This dean comments further:

"It has always been my opinion that the colleges of pharmacy were at fault in failing to show or convince others who are vitally concerned in the progress of pharmacy that it was a good business policy for them to assist the educational institutions in pharmacy."

The Chairman of the Committee is inclined to agree with that statement.

In answer to the question,

"Do you feel that manufacturers and distributors of medicinal products should attempt to allocate funds to various colleges on a basis of a survey such as this or should this be left to individual appeals from the various colleges?"

one of our most successful deans offers the following comment:

"Not unless other factors are taken into consideration, such as need for the school in the locality in which it operates, financial structure, amount of indebtedness in proportion to assets, efficiency of business management, attitude of administrative officers toward the advancement of standards in pharmaceutical education, qualifications of members of the teaching staff, and the number of teachers giving full time to the school."

Certainly this dean has focused our attention on many important facts, which should be considered in the allocation of funds for pharmaceutical education.

On one of the questionnaires we find the following comment:

"Starting with this fall's registration of students, we have discontinued graduate work in the College of Pharmacy. The reason for this is that we believe that it would be better to wait until we are in a position to establish such courses under the direction of properly prepared instructors."

This decision was certainly prompted by good judgment but it is unfortunate that such action was made necessary when we are trying so hard to stimulate graduate work of high quality in our colleges of pharmacy.

Later on in the same report we find:

"It is my personal opinion that if funds are provided by manufacturers and distributors it would be better to have them allocated so that those schools which do not now have endowments may have a chance of securing needed help. If it is left to individual institutions to solicit such help, many inequalities would probably develop. If American pharmaceutical education is to take its proper place, it will need strong colleges of pharmacy, well distributed geographically, in order that there may be no cause for complaint from the drug trade in the several districts of the United States."

From the Mid-west comes the following report:

"We believe that during the past thirty-five years we have rendered a valuable service to the public health of our community and to the betterment of pharmacy in the Mid-west. We know that through the products of our colleges we have made valuable contributions to the personnel of many of our largest and best known pharmaceutical manufacturing companies, and that we have helped to increase the number

of consumers of their products. We trust that we may see our way clear to carry on with increased service."

Does that not sound like the expression of a desire for real cooperation?

Another Mid-westerner writes as follows:

"You will note in the questionnaire I have suggested no needs in our undergraduate college. This does not mean that we do not have needs because we do. I think every college in our Association needs to improve its undergraduate teaching and equipment. But in our own case we have reached a point in our growth where the great need is to develop graduate work. This is undoubtedly true of other colleges in our Association that have strong undergraduate colleges. There is a great need to develop graduate work in our colleges in order to take care of the manufacturing and teaching and research needs of the pharmaceutical industry."

Many deans have commented in this manner on the need for the development of graduate work in our colleges of pharmacy. This is a development which should be of great interest to pharmaceutical industry.

We were interested in the following comment:

"In most instances the industry has assumed a detached attitude in regard to pharmaceutical education. Perhaps this is due to the fact that the older colleges of pharmacy were established by retail pharmacists and most of those of more recent date are state or university supported. However, the industry is now the successor of the retail pharmacist in many respects and as such should be willing to assume the educational projects which the retail pharmacist initiated and which are now beyond his capacity to continue."

This statement seems to be in line with the evolutionary processes which have been operating in the field of pharmaceutical education during the past two or three decades.

We believe you will be interested in the following comment:

"In order to justify assistance, I believe that the future financial security of the college should be reasonably assured. Regular and continued assistance would become burdensome and in itself might not be assured. For example, if an addition to the staff were required, unless the college could provide funds to continue such staff member it would be questionable whether it would be wise to provide initial funds for such purpose. The same principle would apply with reference to salary increases. Briefly, it seems to me the policy should be to help colleges to help themselves; to put them on their feet so they may continue independently."

One of our deans who is noted for his clear precise statements, comments as follows:

"We feel that if the Committee is able to help even a single college to do more effective work its work will have been worth while."



We believe that that feeling is held by almost all college deans. They are appreciative when help is extended to pharmaceutical education, whether or not their college happens to be the lucky institution.

These are but a few of many interesting comments made. They are all worth reading and should prove helpful in the work which is to follow.

The Committee realizes that it has gone into considerable detail in summarizing the information furnished by our college deans, but we feel that you should have the summary which has been presented in order to give intelligent and adequate consideration to the problem at hand.

The colleges, as you might expect, have shown an unusual interest in the work of this Committee. They have been most cooperative in furnishing the data requested and are awaiting the deliberations and decisions of this conference.

The question of financial aid for colleges of pharmacy has been before the Conference for several years without any definite program developing. The Committee requests that the whole question be given careful consideration at this meeting and expresses the hope that some very definite step forward may be taken.

Would it be advisable for the Conference to sponsor or at least recommend the formation of a body made up of one representative of each of the associations holding membership in this body, the responsibility of which would be to collect and allot funds in behalf of pharmaceutical education? Our Committee looks favorably upon such a suggestion.

Perhaps the representation mentioned above is not the proper one. The men in charge of the distribution of such a fund might feel the need of considerable advice from pharmaceutical educators. Perhaps the American Association of Colleges of Pharmacy should have three representatives and the other associations each have one, or the American Association of Colleges of Pharmacy might have one regular representative plus its President and Chairman of the Executive Committee. Perhaps some of you may feel that the colleges should have no representation at all in this body. What do you think about it? What should the personnel of such a body be?

Such an organization might be known as "*The American*

*Foundation for Pharmaceutical Education*" and might very properly be patterned after the Carnegie or Rockefeller Foundations. It is very probable that a better name than the one suggested above can be found. The Committee itself might prefer one which indicated the possibility of a broader scope of responsibility.

The Rockefeller Foundation is governed by a self-perpetuating Board of Trustees of 20 members with the usual officers of organization. This group meets twice annually. Between meetings an Executive Committee of 7 members plus the President of the Foundation carries on the necessary business. The Executive Committee is called together at such times as may be necessary.

The Carnegie Foundation is governed by a Board of Trustees of 25 members, who serve without term and who hold one regular meeting each year. The chief business of the Foundation is carried on by an Executive Committee of 7 members plus the President of the Foundation. The Executive Committee meets once each month with the exceptions of July and August.

The Committee does not feel that either one of these groups offers just the organization which would be best for us, but we do feel that a further study of their organization and operation would prove helpful.

We believe that if manufacturers and distributors could be relieved of the embarrassment of individual solicitations that they might be disposed to make annual contributions to such a foundation and that eventually a very significant fund might be established. If such an achievement could be accomplished, much that is good should result in behalf of pharmaceutical education and hence in behalf of pharmacy.

The organization of such a foundation would not and could not make it impossible for a college to appeal to a manufacturing concern or to an individual for help in developing some special project which seemed worthy and desirable. It would furnish a more effective method of rendering assistance to colleges than the chaotic methods which have been employed in the past. It would also make it easy for a manufacturing concern which is contributing to the Foundation to give a negative reply to such requests without any need of embarrassment and certainly no apology. The Committee does not know just how far you feel it may be possible for

the Conference to proceed with this matter at this time. We realize that many of our delegates, perhaps all of you, will feel that you could not commit your associations to such a project without first presenting its program to them in considerable detail. We do hope, however, that it will prove possible to approve of the recommendation in principle and very definitely pave the way for more specific action in the immediate future.

It has been suggested that a good method of procedure, following the approval of the recommendation, would be to vote the continuation of the Committee on Endowment and delegate to it the responsibility of working out all necessary details relative to the organization of a body whose chief responsibility would be to collect and allocate funds in behalf of pharmaceutical education. In order to get the matter definitely before you the Committee offers such a recommendation.

It would be well if the Committee on Endowment might have the opportunity of presenting its completed plan to the Conference in the near future, possibly during the early part of March. In case our constitution and by-laws allow of but one meeting a year, would it not be possible for us to decide that, due to the pressure of business, we should adjourn until our President calls for a continuation of the December 1940 meeting?

Our constitution and by-laws must, of course be held inviolate but they should be made as useful and serviceable as possible.

The Committee felt it would be inappropriate to present too much detail until the general principle of our recommendation had been approved. We also appreciated that we would at once encounter many involved problems which would need the careful attention of as capable and meticulous a person as our own Mr. J. F. Hoge who, let me add, is hearing this part of our report for the first time.

We presume such an organization would need to be incorporated and chartered. Its officers would probably insist upon the former and the latter would be essential in order that it might receive gifts under the most favorable conditions.

It would need a constitution and by-laws setting forth its objectives, organization, and methods of operation. There

will be other important considerations which it is impossible for the committee to visualize at this time, hence the need for continued careful study by men especially schooled in that sort of work.

The Chairman of the Committee can see some advantage in a very broad statement of the organization's objectives. Possibly they should be as broadly stated as the following: The object of the organization shall be *"To receive and allocate a fund which shall be used to improve and broaden, through educational processes, the services of the profession of pharmacy, as the needs of the people whom it serves may dictate."*

It is only fair to the Committee to state that the above suggestion originated with the Chairman of the Committee and not with his committeemen, who have not even had an opportunity to discuss it. The Chairman can sense objections which may be raised to such a statement but feels that it does illustrate the breadth of scope which may prove desirable.

It is a great satisfaction to talk to a group, such as we have here, about pharmaceutical education and the need for continuous progress in that field. You representatives of pharmaceutical industry appreciate possibly better than anyone else the need for high standards in pharmaceutical education. High standards and high quality are the objectives and goal which you keep ever before you in the manufacture of all of your products. Should present standards of pharmaceutical education ever become endangered, should the four-year course, which has so thoroughly justified itself, be seriously attacked, pharmaceutical educators would turn first of all to their friends in pharmaceutical industry for help and support. It is quite inconceivable that such help would not be forthcoming. The possibility of such a development may seem fantastic and unreal to many of you. It is not the sort of thing which we should discuss publicly, but it is a possibility which we should not take too lightly and which we should be prepared to meet quickly and effectively should we ever be confronted by such an emergency.

College of pharmacy graduates are more and more manning your factories and are largely responsible for the sale of your products to the retail trade. You want and demand capable, well-trained, reliable men in your manufacturing plants. In the research laboratory, in the control laboratory,

on the sales force, or out in the manufacturing divisions of the plant itself, men of such qualities are absolutely necessary if your business is to be successfully and profitably run. The colleges are eager to maintain an adequate supply of such men to help man the many different branches of the profession of pharmacy. We feel that, considering the circumstances under which they have been forced to work, our colleges of pharmacy have done a good job. Like all other colleges which maintain high standards, they have now reached a point where financial assistance is required. How natural it is that they should turn to the manufacturing and distributing fields of their own industry. We know that the possibility of such financial help does exist. We believe that our friends in pharmaceutical industry will want to do what they can to help along in the field of education where their greatest interests lie, the field of education which has and will continue to do most for them.

We are convinced that the problem of financial aid for our colleges can be solved, if we will work together with mutual confidence and with much determination. We trust that when we leave this conference today we shall have made considerable progress in that direction. The Committee feels some sort of an organization such as has been suggested may be the answer to the problem and is definitely worth trying. There could be only one thing which would be worse than doing nothing, and that is to make a false start and fail in our objective. We must carefully think through any project which we may decide to sponsor. All that then remains is to give it our wholehearted support and see to it that it is successfully achieved.

The Committee wishes to state that substantially this same report was presented at a meeting in New York City on November 28, 1940 to the following individuals: C. W. Ballard, R. C. Wilson, A. G. DuMez, W. F. Rudd, C. L. O'Connell, H. E. Kendig, W. P. Briggs, E. Little, R. L. Swain, E. F. Kelly, E. L. Newcomb, S. B. Penick, J. F. Hoge, and F. L. Griffiths.

This group constituted a majority of our Committee on Endowment, together with a number of other readily available individuals, whose opinions were desired. After a thorough discussion, the group unanimously approved the report in principle and were responsible for some relatively

minor changes which were made upon their recommendation. It was pointed out by some of the men in attendance that the organization and operation of such a group is not without an element of danger. The Committee recognizes this fact, which it feels is also true of every worthy venture that was ever initiated. The Committee even sees the possibility of an organization such as we are advocating, developing into a definite liability to pharmacy rather than an asset. Such a development is, however, highly improbable and the Committee is not greatly impressed by any such possibility. We are convinced that the men assuming the responsibilities which will be assigned to them will prove to be capable, conscientious men, whose activities and decisions will be in line with real progress in our profession. Should they, by any stretch of the imagination, prove otherwise, they are not likely to prove successful in their search for additional funds.

We believe that they will minister impartially to real needs in the field of pharmaceutical education. We believe that they will expect much from colleges receiving help. We believe that they will make contributions only to such colleges as they feel can justify their confidence and will not feel obligated to give to any institution simply because it exists and is experiencing difficulty. They will consider whether a college requesting help is essential and should be continued, and if so, how it can best be helped.

The Committee appreciates that not all of our present colleges should be encouraged to continue. It would, in fact, prove unfortunate if some of them are not forced to close their doors.

We vision the group, which we are advocating, giving careful thought to all such considerations and arriving at decisions which will very greatly facilitate the forward march of our profession. We ask your cooperation to that end.

The Chairman wishes to express his appreciation for the helpful attitude of all members of the Committee. He wishes especially to thank Dr. Robert L. Swain and Dr. E. L. Newcomb for their unusual interest and assistance. Dr. Newcomb has for several years advocated more substantial financial help for colleges of pharmacy. He has tried persistently to initiate some project which might prove adequate in handling this difficult problem. I am sure that Dr. New-



comb does not know how pharmacy college deans throughout the country appreciate his interest and efforts in behalf of pharmaceutical education.

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## Status of Pharmacists in the Government Service and Under Selective Service

H. EVART KENDIG

President American Association of Colleges of Pharmacy

For many years each of the three national associations, American Pharmaceutical Association, American Association of Colleges of Pharmacy and National Association of Boards of Pharmacy, had a standing or annually appointed a committee on the Establishment of a Pharmaceutical Corps in the United States Army. The committees were appointed for the purpose explained by the committee title.

After fifty years of futile effort and the expenditure of much time in legislative endeavor, the associations decided to drop their insistence on a separate corps for pharmacists and adopted another plan for improving the pharmaceutical service in the army by legislation which would grant a certain number of commissions to qualified pharmacists in the Medical Administrative Corps.

This proposal was approved by the then Surgeon General Reynolds and the bill, introduced by Senator Sheppard of Texas, Chairman of the Senate Committee on Military Affairs, was passed and signed by President Roosevelt June 26, 1936.

The committees of the three associations worked together very effectively to obtain passage of this legislation.

As one objective, commissions in the army, had been reached, it was decided that due to the opposition of the army to a separate corps for pharmacists it would be wise to drop that proposal until the value of pharmacist officers in the army was shown by the work of those inducted into the service. Therefore the name of the committee no longer applied.

At this time it was decided to broaden the scope of the committee's work and charge it with a similar duty with

reference to the navy. Likewise it was instructed to obtain places for and improve the status of pharmacists in all branches of the government service such as Civil Service appointments, Veterans Bureau and Public Health Service.

Therefore the committee of the A. Ph. A. at the Dallas meeting in 1936 made among others the following recommendations:

- "1. That the committee be continued.
2. That the name be changed to the Committee on Status of Pharmacists in the Government Service.
3. That it be made a standing committee of the Association.
4. That through arrangement with the A. A. C. P. and N. A. B. P., the committee members be appointed as members of the corresponding committee of those associations and function therein so that one committee can represent and speak for organized pharmacy about the status of pharmacists in the government service.
5. That it be instructed to continue its efforts to improve the pharmaceutical service in the federal and state governments and thereby obtain for pharmacy the recognition and status to which it is entitled."

All of the recommendations were adopted.

The A. A. C. P. and N. A. B. P. approved the recommendations and since 1937 one joint committee, the Committee on Status of Pharmacists in the Government Service, composed of three members from each association under one chairman has been charged with carrying out the wishes of the three associations.

The committee operates chiefly by personal interviews with the heads of departments in Washington. Secretary Kelly is in daily contact with one department or another following up proposals.

The Chairman and Secretary Kelly are in regular communication by telephone or post. The Chairman goes to Washington whenever matters of importance require his presence which is rather frequently. The committee is called to Washington only when absolutely necessary. The personnel of the joint committee follows:

*Committee on Status of Pharmacists in the Government Service*

Representing the American Pharmaceutical Association:

B. Tappan Fairchild  
F. L. McCartney  
H. Evert Kendig

Representing the American Association of Colleges of Pharmacy:

Henry S. Johnson  
James H. Kidder  
Carson G. Frailey, Jr.

Representing the National Association of Boards of Pharmacy:

Robert L. Swain  
A. L. I. Winne  
Charles Bohrer

H. Evert Kendig is Chairman of the combined committees.

*Status of Students and Pharmacists under the Selective Service Act*

The most frequently recurring questions in letters from every part of the country for information about the status of pharmacists under the Selective Service Act are answered in this article. The letters are received by the writer as Chairman of the Joint Committee on the Status of Pharmacists in the Government service.

The Selective Service Act itself defers the training of all students in schools and colleges of pharmacy until the close of the current academic year and in no event later than July 1, 1941. To obtain such deferment it is necessary that the student request deferment in his questionnaire.

Only students enrolled for the degree are eligible for this extension of time and the number of hours in attendance in school must be such that it constitutes his major employment. Special students, even though enrolled for a degree, who attend classes for only a few hours per week and give most of their time to other duties such as work in a drug store or laboratory, would not be deferred on the basis of student occupation.

A student whose status changes by withdrawal during the course or at the end of the scholastic year is required to report such change within five days to his local draft board. After July 1, 1941, all students cease to enjoy special status.

Every effort is being made to defer the training of bona-fide students of pharmacy until after graduation. Strong representations have been made to those in authority about the serious situation which would result from stopping the supply of pharmacists at its source. This argument has been based

upon the estimate that about three thousand pharmacists are required annually for normal replacements and the fact that for the past three years the schools and colleges of pharmacy in the country have graduated a yearly average of 1695.

Reports received from all sections of the country indicate a shortage in the supply of practitioners and in some areas the situation is becoming acute.

It is believed and expected that a satisfactory plan will be approved for the deferment of students in the medical, dental and pharmacy schools as the situation and requirements in the three professions are much the same.

Bills have been introduced in Congress for the deferment of the training of groups including one by Senator Murray and Representative McCormack which provides that medical and dental students, interns and residents shall not be conscripted until the completion of their training. We are watching such legislation very closely and are prepared to take appropriate action if there are indications that the problem will be solved in this way.

Some high officials are opposed to group or occupational deferments and the health services' requirements may be taken care of by individual deferment through the local draft boards. In view of this possibility it is important that students so apply themselves that they close the year without conditions. If further deferment for them is granted as a group or individually, it is not likely that students will be placed in this category if their scholastic records are not entirely satisfactory. One proposal we have made would require certification of a satisfactory record by the dean. The plan was received with some favor.

Graduates inducted into the service are sent to the medical department of the army for their training. This is supposed to be done as soon as classification can be made at the camp. Enrollment in the American Red Cross as a pharmacy technician, notation of that fact on the questionnaire, and presentation of the enrollment card at camp will help to facilitate transfer to the medical department.

The pay for the first three months is \$21.00 per month with subsistence. At the end of this period those who qualify will be given the rating of technical sergeant (pharmacist) with pay at the rate of \$1008.00 per year with subsistence.

The lower pay during the first three months has no relation to the duties performed which during any period are expected to train the draftee for pharmaceutical service according to army requirements. The U. S. comptroller has ruled that under the law all men not having commissioned status must receive the base pay of \$21.00 for the first three months served in the ranks.

The opportunity for the rank of technical sergeant is available for all graduates of recognized schools of pharmacy.

In addition to this opportunity, graduates of the four year course will be under observation and those who possess this educational qualification along with the other requirements for the officer personnel will be granted commissions as second lieutenants. Those accepted will be commissioned as reserve officers in the Medical Administrative Corps and immediately be called to active duty for the remainder of their training period. At the end of that time, should an emergency not exist, they will be returned to the Officers' Reserve Corps.

The number to receive commissions is problematical; the medical department does not know just how many officers will be required nor how many can be placed. The problem has been and is being studied carefully by the Surgeon General and all conferences with his officers indicate a desire to maintain an adequate and satisfactory pharmaceutical service and to place well educated pharmacists wherever their training fits them for useful service.

The pharmacy officer is so new in the army that a pattern for his use has not been established. I believe the freer use of pharmacists will come after a certain amount of experimentation.

The question is so frequently asked, "What should I do to get a commission as a second lieutenant?" No standard procedure has been set up; the young man should be a good soldier, conduct himself like a gentleman and indicate by his conduct and diligence that he is able to command and direct the efforts of others. Aptitude and proper attitude will commend him to his superiors who have the power and duty of recommendation.

The Congressional Act signed by the President June 26, 1936, provided for sixteen pharmacist officers in the Medical Administrative Corps. The appointments have been made and

additional appointments can only be made when vacancies occur. An increase in the number can be brought about only by legislation.

With the passage of this act, the Officers' Reserve Corps was opened to properly qualified pharmacists. Three hundred and three pharmacists hold commissions in this reserve force. Last summer the Reserve Corps was closed but applicants will, no doubt, be accepted again when the present number has been sufficiently reduced by transfers to active duty.

#### *Drug Preparedness*

When the United States entered the war in 1917, it was not prepared for a major conflict. The army did not know what it wanted or required. There was a shortage of many important raw materials. Power, fuel and transportation were inadequate. There was a scarcity of trained help, skilled labor. We relied on the allies for many of the sinews of war. It was more than one year before we could ship troops to France, and fifteen months until army training justified the use of our troops in front lines.

The situation in 1917 possibly was excusable as prior to that time we had a very small standing army—25,000 for many years. Supplying an army of 25,000 was a simple matter, the types of equipment were few in number and in those days, simple in design. Especially was this so in the medical department. Serums, vaccines, antitoxins, and toxoids were in the experimental stage, vitamins were unknown and insulin remained to be discovered; hormone was just a word. Therefore it is not surprising that we endured many trials and tribulations in the effort overnight, to expand the army to 4,000,000, equip it and safeguard its health.

Our experiences of 1917-18 taught us a lesson. Out of the trials of World War I, grew the National Defense Act of 1920. This was a serious attempt on the part of Congress, activated by the army and navy, to put our house in order and prepare for the future.

Section 5)a) of this act charges the Assistant Secretary of War with the duty of adequate provisions for the mobilization of materials and industry, in time of need, sufficient to care for the military as well as the civilian needs.

While the problems involved ramify far beyond the normal functions of the War Department, the important fact remains



that the army and navy are directed by legislative fiat to prepare a plan by which industry will lend adequate support to the military forces if, when and as required:

A thorough understanding of the problems of industry by the army was necessary for the setting-up of a workable plan, so in 1922 the Army Industrial College was established. The purpose of the course offered is to train officers with special aptitude in—(a) industrial organization and mobilization of materials, (b) the technique of supervising wartime procurement of military supplies and (c) general instruction in the responsibilities incident to an emergency. Eight officers are on the faculty, sixty officer students—all departments of the army represented.

Included in the course is the study of chemicals, medicinal materials and hospital supplies.

With this background of two decades of study and experience the revised Industrial Mobilization Plan of 1939 was born and became effective.

In October 1939, at the request of the War Department, there was formed under the leadership of the American Drug Manufacturers Association, a body known as the Drug Resources Committee. The function of the committee was to aid in making effective the provisions of the National Defense Act especially with reference to medicinal supplies.

Carson P. Frailey, Executive Vice-President of the American Drug Manufacturers Association, was appointed Chairman and the membership consists of twenty representatives from the leading drug and chemical manufacturing companies of the country.

Until last fall the relations between this committee and the army and navy were on an informal basis. Now they have been formalized by a revamping of the entire set-up so that the committee can carry on its preparedness work for the Army-Navy Munitions Board and the National Defense Advisory Commission.

The name of the group has been changed to Drug Resources Advisory Committee. Personnel and program remain essentially the same.

This committee has made very complete surveys of the drug industry, collected information about facilities for production, available raw materials, stocks of drugs, and reports

to the Army-Navy Munitions Board, which, in turn, passes necessary information along to the Defense Commission.

G. R. Holden, formerly economic advisor to the Eastman Kodak Company, has been serving as liaison man in this field for the Defense Commission. He is on the staff of E. R. Settinus, Jr., Defense Commissioner in charge of raw materials.

Mr. Settinus has a division of Chemical and Allied Products, with E. R. Weidlein, former Director of the Mellon Institute, as the executive in charge. Included in the set-up are Commander C. R. Andrus of the navy, and Col. C. F. Shook of the army, who is Chairman of the Medical Supplies Committee.

Drug preparedness work covers civilian as well as military needs. The requirements of the civilians are just as important as the needs of the armed forces. War today is a contest between whole populations. One group at the front, the other behind the lines manufacturing supplies for the combat forces.

Therefore it becomes very important to maintain proper morale at home. The man and woman in the fields or munitions factory must know that their relatives or friends at the front have proper medical attention and the man on the firing line must not be worried by reports from home of lack of medical care.

In everything that is being done or planned in connection with preparedness, great consideration is given to civilian requirements. It is understood that as far as possible emergency measures will interfere as little as possible with the normal medication practices of the citizen. This would seem to include every procedure from prescriptions to common remedies used for self-medication.

The Defense Commission includes departments for raw materials and for finished products. The Drug Committee acts in an advisory capacity on both raw and finished substances.

While acting in an informal capacity for the year following September 1939, the Drug Resources Committee completed raw material and production capacity surveys on *almost every essential drug and drug product*.

The National Defense Commission now has available this great mass of valuable material. Drug preparedness was well

under way when the Defense Commission became active and I believe our program is much further advanced than in most industries.

For instance, and this is typical of the work done, it has been determined that the established laboratories have today facilities for an entirely adequate supply of biologicals for the army, navy and civilian population.

The Drugs Resources Advisory Committee is divided into the following sub-committees: pharmaceuticals, medicinals, hormones and glandular products, biologicals, botanicals, fish liver oils, surgical dressings, narcotics and containers.

Some idea of the magnitude of the committee's work may be obtained from the consideration of just one drug, acacia, by the Sub-committee on Botanicals. We think of acacia in connection with emulsions. The committee found that acacia was an essential material in fifty different industries. Therefore, an adequate supply of this botanical has significance far beyond its pharmaceutical employment. For instance, if a rug manufacturer cannot obtain acacia, there is interference with civilian life at every point of rug contact from factory worker through the distributive channels down to the ultimate owner.

All of this work has been done without publicity or beating of the drums; little about drug preparedness appears in the newspapers. It is not wise to publicize many of the activities in this area. Let me assure you that this entire matter is well in hand and the country has little to worry about concerning medicinal materials which are of such vital importance during national emergency.

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*OFFICERS-ELECT FOR 1941-1942*

The Board of Canvassers of the American Pharmaceutical Association has announced the result of the mail ballot for the officers as follows—

|                                   |                   |
|-----------------------------------|-------------------|
| President Elect.....              | B. V. Christensen |
| First Vice President.....         | J. K. Atwood      |
| Second Vice President.....        | L. W. Rowe        |
| Members Elect of the Council..... | R. L. Swain       |
|                                   | P. H. Costello    |
|                                   | F. E. Bibbins     |

Installation of these officers will take place at the next annual meeting which will be held in Detroit, August 17-23, 1941.

## Editorials

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### Disorganized Overorganization in Pharmacy

The multiplicity of organization in American Pharmacy has led many to the conclusion that there is great over-organization. Many times it has been suggested that most of the existing groups could advantageously merge. The arguments, pro and con are well known to all.

While it is true that too many organizations exist it is also true that too many of them are very poorly supported, particularly by the retail pharmacists for whom the organizations are primarily constituted. This becomes readily apparent when one considers that with some 100,000 pharmacists in this country such an organization as the American Pharmaceutical Association can show a membership of only about 3,000. Further, of these a large group are not directly connected with retail pharmacy. After all, retail pharmacy is the *raison d'être* for the schools, commercial laboratories and other institutions whose personnel make up such a large proportion of such organizations. Without the whole-hearted support of the retail group the amount of constructive work which can be done is strictly limited.

It is difficult to determine the real blame in this situation. Possibly, and probably, in many instances the training of the pharmacist has been lacking in that he has not been impressed with the importance of organization. Later, he has seen the futility in the attempts of organizations to bring about gains and he has concluded that there could be no value in supporting such a cause. Multiplication of this case by several thousand brings us to our present situation.

The colleges of pharmacy can render a real service in bringing order out of this disorganized over-organization. Many are already doing a good job. The establishment of student branches of national organizations with frequent and intensified advocacy of membership is a definite step forward. If all the colleges in the country were to follow this procedure there would be, first, a sizable increase in membership each year and, secondly and more important, the incul-

cation of the value of organization to the progress of the profession. True, the advance would be slow but the building of a firm foundation is the first step in the construction of a lasting edifice.

Elmon L. Cataline,  
University of Michigan.

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## Why Pharmacognosy is a Necessity in the Training of the Pharmacy Student and for the Work of the Practicing Pharmacist

The term pharmacognosy conveys to the mind of a pharmacist a multitude of varied impressions. Some may be led to reminisce of school days spent in well-stocked crude drug laboratories, while others are presented with the challenge of a much broader subject yet to be mastered. Pharmacognosy has always been a part of the pharmaceutical curriculum, and rightly so, since from the very beginning this profession has constantly sought to improve the state of man through the use of crude vegetable and animal drugs and their preparations. Biologicals, vitamins, endocrine products and chemotherapy have not changed this picture but have merely extended the field of therapeutics in new directions.

To undersand why a student takes a course in pharmacognosy, it is first essential to know what the course embraces. Early courses doubtless consisted of the ordinary routine of learning Latin titles, official definitions, constituents and doses and uses, which were essential to becoming registered. Today, we have become too practical to accept this as a goal, with the result that pharmacognosy is being developed with an eye to its future usefulness to the pharmacist regardless of what branch of the profession he may enter. This change in scope has necessitated some earnest thinking on the part of the teachers of pharmacognosy in order to bring a cultural subject into the realm of useful and practical studies.

Pharmacognosy and its relationship to pharmaceutical education is comparable to one of the basic substances essential to a building program. A veneer of brick may cover the steel supports, but there is no denying that these hidden

girders maintain the structure. As a basic science, pharmacognosy represents one of these steel beams that will be rendered obscure by the veneer of merchandising. Nevertheless, it will continue to be a source of satisfaction in his every-day life. Teachers are no longer laboring under the impression that the retail pharmacist will collect his own crude drugs, or that he will even stock them as such on his shelves. They do, however, have the impression that a professional man becomes such only when he possesses unusual training in his field, and that is what the study of pharmacognosy does.

As a retail pharmacist surveys numerous packages which adorn his shelves, it should be a great personal satisfaction to know he is capable of judging their contents. The label on the box of laxative pills reads that cascara and aloes are in the formula. Their acceptability is assured, for the pharmacist knows these drugs and the standards which govern them. Among the prescription room bottles are fluidextracts, tinctures, elixirs and isolated active principles. Preparations, yes, but back of each and every one there is a crude drug which had to be collected and prepared for market. It has a specific source, purity rubric, assay requirement and perchance a bit of interesting history, but best of all, it has behind it two books which guaranteed its perfection before the drug was ever made up into those same preparations. True it is that the retail man cannot possibly master all of these details, but that should not lessen his desire to know nor the pride in his superior merchandise because it is done. The fact that pharmacognosy enables him to know these drugs and preparations better by being able to read intelligently the United States Pharmacopœia and National Formulary monographs, alone would justify its being a required course.

To substantiate the claims that pharmacognosy has something to offer beyond the simple mastering of official titles, official definitions, constituents, assays, and doses and uses, attention is called to the following outline of instruction a student has covered upon the completion of his course in pharmacology.

1. General or pharmaceutical botany. (The detailed study of plant parts and their functions.)
2. Official definitions, sources, constituents, doses and uses of crude drugs.



3. Taxonomic consideration. (Identification and preparation of herbarium specimens.)
4. Medicinal plant cultivation. (Propagation, cultivation and harvesting crude drugs.)
5. Collection and preparation for the market of crude drugs.
6. Preservation of crude drugs and preparations.
7. Drug milling for such preparations as tinctures and fluid-extracts.
8. Histology of vegetable and animal drugs.
9. Microanalysis of foods and drugs.
10. United States Pharmacopœia and National Formulary monograph preparation and interpretation. Assay procedures.

Actual student participation in carrying out the above program imparts to his training a professional aspect which separates him clearly and distinctly from the ordinary merchant. The retail pharmacist today knows his merchandise better than ever before, by virtue of which he safeguards the confidence of those whom he serves. He has a training in his own field that is possessed by no other professional man.

L. David Hiner,  
Ohio State University.

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## The Value of Pharmacognosy to the Retail Pharmacist

Varied opinions exist among the pharmacists of the country as to the value of pharmacognosy to the retail pharmacist. There are some who think that study of plant and animal drugs should have a less conspicuous role in a pharmacy curriculum at the present time. I should like to point out that this branch of applied science is of even greater importance than during any of the past decades.

Pharmacognosy has for its object the study of drugs, and the portion of the plants and animals yielding them. The main object is not to determine the identity of the drug and its origin, but comprises the study of its constituents and the factors influencing their variation. This means that drugs of recognized value are given principal consideration from a pharmacognostical standpoint. The modern pharmacist is no longer called upon to stock his containers with the great number of crude and powdered drugs, which were considered essential necessities in the earlier revisions of the U.S.P. and

N. F. He rarely, if ever, has a call for wahoo bark, seneca snakeroot, tamarinds, or tansy tea. Tradition of long usage is not sufficient reason for them to continue to occupy an important function in pharmacy.

Chemical investigation and scientific progress in the more recent years has thrown a new light on the plant and animal products. Many drugs are found to contain one or more active principles upon which the entire therapeutics value and pharmacological action depend. Other drugs contain principles which have defied separation up to the present time, but the chemical and physiological nature of them is more clearly understood. And, also, there are many plant drugs used in medicine that are considered pharmaceutical necessities which may only contain coloring principles, mucilaginous substances, and volatile oils. Thus, with the greater number of pure plant or animal products and crude drugs of established merit, pharmacognosy becomes a more significant and important science for the retail druggist. His prescription department is stocked with the many and ever increasing principles of such drugs as digitalis and ergot. The alkaloids and glucosides, volatile and fixed oils are derived from plants with which the druggist should be familiar. The vitamins and hormones and the sources from which they are derived should be of the greatest interest to the professional man and woman who dispenses them.

The student of pharmacognosy is no longer encouraged to study the detailed characteristics of the many almost discarded drugs which found their way into the drug store. It is those drugs which are having better standards provided for them and those products which have recognized pharmaceutical and therapeutic value that the student studies and investigates. After completing his college work and entering the retail field it is to be hoped that he will be imbued with the idea of keeping abreast with the advances in pharmacognosy. His knowledge of plant drugs will not embrace just a large number of the once used products but he will be alive to the continual progress in the field.

Forest J. Goodrich,  
University of Washington.

## Our Debt to the Pioneers in Pharmaceutical Education

With the passing of so many pioneers in the field of pharmaceutical education it seems appropriate to reminisce for a moment on the standards and aims of those who had sufficient courage to pioneer in this field. These efforts are our heritage and we should be grateful for the sound foundation laid down by them which has enabled their successors to continue to build toward the goal set by those who were the initial lights. When John Morgan started teaching pharmacy at the University of Pennsylvania in 1765, he probably did not realize the future of formal pharmaceutical education in the United States. From this meager but noteworthy beginning it took fifty-six years for the roots of pharmaceutical education to gain sufficient headway to result in the founding in 1821 of a school of pharmacy, namely, the Philadelphia College of Pharmacy. The founding of this institution gave the impetus that caused the establishment of schools in many parts of the country. The organization of the Massachusetts College of Pharmacy followed in 1823. In 1824 the Medical College of the State of South Carolina started a course in pharmacy but did not receive its charter until 1832. In 1829 the College of Pharmacy of the City of New York came into being. Then followed departments in Tulane University in 1838 and the Maryland College of Pharmacy in 1840. Thus, before 1850 there were six schools or departments for the teaching of pharmacy. In the comparatively brief span of ninety years, we find that the number of colleges training men and women for practical and professional pharmacy increased from six in 1850 to over sixty in 1940. As was true in other phases of educational development, the first colleges were founded in the east. Another noteworthy trend is that many of the schools started as small private affairs with the one aim of training students in pharmacy. Later, they became incorporated into larger institutions, mainly state colleges and universities. At the present time there remain a few private schools of pharmacy but most of the training is done in colleges or universities having departments or schools of pharmacy holding a recognized place in the higher educational system.

The greatest progress in the founding of schools of pharmacy occurred from 1880 to 1910, during which time thirty-seven schools were established. From 1910 to the present time, the number founded diminished. Very few schools of pharmacy have been discontinued, which probably indicates that they are filling a definite need for formal pharmaceutical education.

A great deal has been written relative to the history of pharmacy in the United States. Comparatively little, however, has been written about those pioneers who were possibly not the very first but who were, nevertheless, pioneers in their own section of the country. The dates of founding, the affiliations which later took place, and the names of those who comprised the original faculties are enshrined in the historical records of the respective institutions. In the original faculties of these institutions are to be found the names of men whose lives and deeds have been an inspiration to their students and fellow workers. Their idealism and their efforts were the foundation stones upon which the present educational program has been built. The memory of what they stood for and what they did, gives us courage at the beginning of a new decade of endeavor.

Ernst T. Stuhr,  
Oregon State College.

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The commonwealth has provided a great University—great in the physical plant and equipment which are visible but greater still in the community of scholars and teachers. What you accomplish here will depend as much on what you bring to the university as what the university brings to you. No man can deny you an education if you are determined to get one; no man can lead you to an education unless you have the will to get it.—Virgil M. Hancher, President of the State University of Iowa.

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#### MARRIAGES

Dr. Lloyd McClain Parks, instructor in pharmaceutical chemistry, University of Wisconsin and Miss Irene Marie Comiskey, on August 24, 1940, at Tomah, Wisconsin.

Mr. Frederick William Schiller of the McNeil Laboratories, Inc., Philadelphia, and Miss Doris Ann Griffith, daughter of Dean and Mrs. Ivor Griffith, on October 26, 1940, at Abington, Pennsylvania.

## The Editor's Page

The date, I cannot recall. The place, was a hotel in Minneapolis. The occasion was a dinner in honor of Dean Frederick J. Wulling who was completing his twenty-fifth year of service at the University of Minnesota. Men of distinction had gathered from distant points in the nation and druggists, by the score, were there from hamlets in all parts of the state of Minnesota to honor a pioneer in pharmaceutical education in the middle north. At this distance I cannot recall a single statement made on that occasion by any of the distinguished visitors although many worth while things must have been said. In fact, I cannot recall a single thing that Dean Wulling said that night and he usually says something. But Emerson Wulling! It was my first introduction to Emerson, a lad of perhaps fourteen or fifteen summers. He was the last on the program, he eulogized his father, climaxed the occasion and stole the show. When he had finished we no longer thought of his father as a dignified and distinguished leader in American pharmacy. Emerson had reduced him to just a member of the order of fathers. Another twenty-five years have rolled by since that night. During that time approximately thirteen hundred chickens have graced my dinner table on as many Sundays. Thirteen hundred times have I thought of Emerson as I found placed upon my plate—a chicken's neck, a piece of skin, a dried up wing, or a tail bone—those parts which Emerson designated that night as "parents parts". I am grateful to Emerson for showing me how boys view their fathers. Otherwise I might have missed a large part of the fun of having been the father of six children. In the meantime Emerson has grown up. He has become a connoisseur and a patron of art, having specialized in the finest of all arts, the speaking and the writing and the printing of the language of his native land.

And that brings me to "Pharmacy—A Vanishing Profession?" by Emerson G. Wulling which appeared in the December, 1940, number of *Hygeia* and which is reprinted in this issue of this journal. In this article the author has used his mastery of the fine art of English with telling effect. In one paragraph he carries us to the bottom of the slough of despond.

In the next he has us riding the crest of the wave and catching a glimpse of what may lie beyond the horizon. He has answered the question raised in the title in no uncertain terms,—Pharmacy is not a vanishing profession. And there I would let the matter rest if a number of requests, including one from Dr. Morris Fishbein, himself, had not come, asking for comment. In order to do this it is necessary to make comparisons with the medical profession, and in doing so, none are made with an invidious intent. The two professions have aspects that are parallel.

In the first place it seems to me the author has made the usual mistake that is made, not only by the layman but by medical men and pharmacists as well, by eulogizing the drug store of the middle ages. That drug store was the epitome of superstition. There is more scientific knowledge and scientific endeavor represented in the bottles on a six-foot shelf in the most "Highly commercialized drug store of the comics and gag-men" than in the whole of that ancient pharmacy. Hippocrates, 400 years B.C., started the divorce proceedings between scientific medicine and superstition and 600 years later, along came Galen, who was a prolific recorder of statements, incorrect. They, nevertheless, got into the teachings of the church and as a result medical progress took a furlough of 1500 years. To break the bonds of superstition it took such an unholy act as the burning of Servetus at the stake by the order of John Calvin, the founder of the Presbyterian Church. In the face of such a record I think the Shades of Galen should go into permanent retirement. In other words, the ancient and much lauded apothecary shop practiced a pharmacy contemporary in every way with the medicine of Galen's day and when we compare it with the modern commercial drug store, we do the latter an injustice although the manager may be only a good business man.

In the second place, I wonder if pharmacy in its entirety is over commercialized? Medicine is highly commercialized. The difference between the commercialism in pharmacy and in medicine lies in the fact that in pharmacy we have tangible merchandise to sell. What the doctor sells is much less tangible. He can therefore more easily cover it up with the cloak of humanitarianism. It is certainly true that the ability to make money is necessary to insure stability and render a service in either business or in a profession. Then



the question arises—is a druggist in a hamlet in Nebraska justified in selling other merchandise in order to make it possible to supply antitoxin or antivenins or digitalis to that community? Will selling this merchandise make him a less efficient druggist? I have a doctor friend who is a director of a bank and the major owner of a prosperous brick manufacturing plant. I am wondering if he is justified in doing this. I am sure it takes a considerable amount of his time. The question is—is he a less efficient doctor because he is the director of a bank? I know druggists who I am sure would be better pharmacists if they were better business men. I also know doctors who I believe would be better doctors if they were better business men. Of course, in either case I recognize there are other qualities which I need not discuss here, which are necessary for the production of efficient professional men. The much lauded prescription pharmacy has not been the great success some prophesied it would be a few years ago. Like everything else, such a store passes with a personality. The sandwich hour was moved into the department store, into the bank, into the factory, and into the hospital. Has the sandwich made these institutions suffer either in dignity or in service because this has happened? On the contrary I am told the efficiency of these institutions have been increased with no loss of regard from the public. Then why should a sandwich be such an object of scorn in a drug store? It certainly would be unwise to divorce merchandise from a drug store if by so doing it would lessen the pharmaceutical service that the drug store can give. Irrespective of its size, the shelf of drugs is the heart of a drug store.

The age of quick transportation has not solved the medical problems in the great rural sections of the middle west. The automobile has brought the farm closer to the town. At the same time, it has moved the towns farther apart. I have known of patients seriously sick lying for forty-eight hours waiting their turn for the doctor whose home town was only twenty miles away. There are entire counties without doctors. There are rich communities that once supported two physicians that now have none. The most common complaint that the taxpayer makes is that he supports a medical school but gets no medical service. The highly trained doctor stays in or migrates to the populous centers. The doctor has moved out of the country. The chiropractor and the neph-

thropath has moved in. And then we wonder why the taxpayer is looking for a way to get medical service all the time for his family at a figure which he calls reasonable. In pharmacy we expect to profit by this experience in medicine and not separate the drug store from each community where people live. The service which the pharmacist can render to a community is quite as important in the field of agriculture, horticulture, veterinary medicine and the industries as it is in public health. We no longer think of the pharmacist as one who manipulates a pair of burrettes or works with a mortar and pestle or compounds prescriptions only. There are distinct ways which are peculiar to the pharmacist alone in which he can serve in some way every phase of community life.

The possibilities of service by the members of any profession depend upon its educational program and the care which is given to the selection of the men who enter it. We shall continue to plan our program of pharmaceutical education with the idea that the work of the retail druggist is the backbone of American pharmacy. In our program we do not propose to make a scientist out of every student of pharmacy, but we do expect to train him so he can practice pharmacy scientifically and enable him to move in a larger sphere of usefulness.

The development of graduate work in the pharmaceutical sciences in many of our best schools is preparing men for the research and educational needs of the profession. Not only is a man of higher caliber found today in our laboratories and hospitals and on the research staffs of manufacturing houses and in the teaching profession, a finer type is found in the retail drug stores everywhere throughout the nation. In the language of our illustrious President let me say "We planned it that way," and we shall continue to follow that plan. We are grateful to Emerson Wulling for his inspirational article and we are grateful to Dr. Fishbein for giving it room in *Hygeia*. I know of no more appropriate way of closing these comments than to use the words of the elder Wulling—"In the future of Pharmacy I have great hope. Cheerio!"

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One of the tragedies of American pharmacy is the disorganization of its organizations. Dr. E. L. Cataline com-

ments upon the subject in an editorial in this issue. This comment carries me back thirty-three years, when in 1908 I became a member of the American Pharmaceutical Association. When I paid my first dues I thought I was a member of a democratic pan-pharmaceutical association. I soon discovered it was neither democratic nor pan-pharmaceutical. As might be expected in the course of time a group of new comers set out in an attempt to make it so. This movement, when it seemed to be making some headway, caused a flurry of anxiety among the old-timers and the most brilliant cogitators (statesmen) were called on to perfect a scheme of reorganization. Why an emergency arose for reorganization at the time it took place was not entirely clear to sideliners. Some said that it was to give the rank and file a greater share in the government of the Association. Others said that it would increase the membership. The reorganization plan was presented at the Ashville meeting in 1923 and placed in effect. Men then found the control, though more complicated than before, remained in the same hands. As regards the effect on membership, let's see what the printed record shows. In 1908 the membership of the A. Ph. A. was approximately 2,100. In the period from 1908 to 1923 (reorganization year) it increased to 4,300, an increase of 2,200 in 15 years. In 1941 the approximate membership is 3,000 (Dr. Cataline's figure). This means a decline in membership in the last 18 years of its existence of 1,300. That is another tragedy of American pharmacy in a land where there are 100,000 (Dr. Cataline's figure) potential members. Certainly an organization with that kind of a membership record can scarcely claim to be pan-pharmaceutical, although it does have a significant name. The A. Ph. A. has become a purely scientific and professional organization and as such it has a leading role to play in the future of American pharmacy as it has in the past and it deserves the moral and financial support of every member of the body pharmaceutic. It is the soul of scientific and professional pharmacy and I am not so sure but that I am happy it has become what it is rather than a powerful political body. If the reorganization did it, perhaps it is vindicated.

Dr. Cataline calls attention to the fact that the retail druggists themselves do not support the very organizations which are primarily constituted for them. And here he

touches a vital point. From the retail druggists' viewpoint he never asked any one to form an organization for him. If I were a retail druggist, I would want to form an organization for myself.

The growth of the National Association of Retail Druggists has been rather remarkable and I believe is due to the fact the retailers feel that it is their own organization. If American pharmacy is ever to be brought together in one group, it has got to be done by organizing from the bottom upward and not from the top downward, that is only good sense. Such an organization will have to begin with the retail groups. Whether any existing organization can be used as a skeleton for such a development no one can say and why should we care if by some plan we could weld all pharmaceutical groups into one efficient body. After all, I am not sure that this is necessary or even desirable. What is more important is that all pharmaceutical organizations have unity of purpose. There is abundant evidence even in the articles and reports published in this issue of this Journal to show that this unity of purpose is developing among our present organizations as indicated by the sympathetic interest shown by all of them in the promotion of professional practice and the support of pharmaceutical education and research. Every sign points to great things ahead.

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It is reported that the University of Kansas in celebrating its diamond anniversary next year, proposes to show the present generation what a drug store was like in the gay nineties. To those of us who lived through the gay nineties and did not find them so gay, it would seem more to the point to show the public what a drug store in 1941 ought to look like to command the respect of the people as a public health institution. Museums are all right in their place but on an occasion of this kind it would look like passing up an opportunity if we should look backward instead of forward. Perhaps a display could be worked out which would show that the modern drug store has become a scientific establishment. Such an effort would have great educational values.

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The December 15th issue of the Canadian Pharmaceutical Journal reports a druggist of Toronto was charged under

the Opium and Narcotic Drug Act for failing to keep a record of purchases and sales of narcotics and for failing to keep such narcotics securely under lock and key. He was convicted and given the choice of paying a \$200.00 fine or serving three months in jail. Apparently Canadians expect druggists to observe the laws which have been formulated for the safety of the public. It might be worth while for those of who live south of the border to think that over—for the sake of professional dignity and professional respectability. The pharmacists of Minnesota have been doing that very thing and we believe it pays. When it is done pharmacy not only grows in self respect but in the respect of the public. One of the difficult things to understand about a dog is that the master can kick the dog around and still have the dog love him, but the pharmacist can not continue to kick around the laws that have been brought into existence for the protection of the public and then have the public hold him in esteem. Nothing is so disastrous as to disregard the rules that one lays down for his own conduct.

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A paper by Dr. Charles O. Wilson in which he shows the practicality of teaching pharmaceutical arithmetic in a course in elementary pharmacy and one by Dr. Elmer M. Plein on a practical method of teaching Latin in a course in dispensing are highly commendatory to the authors. In the secondary schools arithmetic has for decades been relegated to the grades below the high school and to retain it in the pharmaceutical curriculum is to make a professional curriculum look like the program of a secondary school. To try to dignify it by calling it "pharmaceutical mathematics" is only a mild form of deception which may lead to greater embarrassment in the presence of a company of scholars. The so-called course in pharmaceutical Latin is not a standard language course and again it should have no place in a professional curriculum as a unit course, but the student should be taught how to use it as a tool in a practical way and Dr. Plein's applications are of the greatest practical educational significance. No one could be so silly as to say arithmetic and Latin are of no importance in pharmacy. They are indispensable in practically every course in the curriculum. We maintain the basic courses belong in the secondary school curriculum and their practical

applications are in all the courses of the professional curriculum. It is conceded that certain courses offer unusual opportunities for acquiring skill in arithmetic and Latin. The most refreshing thing about these papers is that they are both based upon classroom experiment and experience. They are not just words. We are looking for more papers with this type of background. I have a feeling that we are getting somewhere now.

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From time to time we have pointed out trends in this country which are indicative of pharmaceutical progress and which mean greater opportunities and possibilities in pharmaceutical service. Our hopes become even greater when we learn of the progress that is being made in other lands. We are grateful to Dr. Orlando Cattani of the Social Security Board of Chile for the information which he has given us about how his country is making it possible for all the people to have medical service and the part pharmacy has in it. We are grateful to Chile for having sent Dr. Cattani to this country to study things pharmaceutical. We are also grateful for the contagiousness of his personality which radiated friendliness wherever he went and made us love Chile. We shall look forward to your coming back, Dr. Cattani. And our own Dr. Arno Viehoever who is on leave in the employ of the Government of Thailand. His article and his letter breathe information and enthusiasm concerning the possibility and service in all phases of pharmaceutical endeavor on the other side of the world. We shall look forward to his home-coming and the wealth of information and experience he will bring.

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A great company has gone home. In the case of each a close personal friend has told briefly of the life of each. Little can be said on these occasions. There is no language that can express the depth of human feelings, but we want the families of Mrs. Cook and Prof. Gauger and Dr. Fuhrmann and Dr. Crockett and Dr. Rusby to know that there are thousands who do care and thousands who are sharing your sorrow and thousands that share your hope that we shall meet again. The passing of every friend is a challenge for us to carry on with a greater sincerity and a greater zeal.

Rufus A. Lyman.



## Gleanings from the Editor's Mail

It was such a pleasant surprise to hear from you and I hasten to reply, even though I am in the midst of final preparations to leave for a two or three weeks' trip to the northern hilly section of Thailand.

I have been entrusted to lead a party made up of an European apothecary, a Philippine soil chemist, a Russian geologist, a Thai medicine man and collector, and a Thai pharmacist, (a native of the region, near Chiengniai, the capital of the north). There we aim to locate suitable land for a drug plantation, under scientific management and extensive enough for commercial development. Incidentally, we are also scouting for the right location to plant a cinchona farm. Of great help should be the counsel of an Englishman, who came to this region some thirty odd years ago as a member of the Forestry Department.

This will be my second exploratory trip up north, and I look forward with great pleasure and anticipation of acceptable results. I would surely write you now a newsy letter of my many interesting experiences here, but must defer this desire until my return.

Inasmuch as you requested some material for the American Journal of Pharmaceutical Education I have prepared an article which you may find suitable as evidence that pharmacy is coming rapidly into its own in Thailand. Most credit belongs to Dr. Toa Labanukrom, a wide-awake Thai, trained in Europe, and experienced through world travels, including the United States of America. He helped to overthrow the old Thai government and is now a member of the Governing Council of Ministers. In addition he is Department Minister of Economic Affairs, Director General of the Department of Science, and incidentally, also Dean of the School of Pharmacy. As such, he would deserve a special writeup, in my opinion, which could probably best be done when the new college of pharmacy, now half finished, is completed. He is in the exhibit picture, as well as the last graduating class picture. In the new four year academic course, thirty-eight are enrolled in the first year, and twenty-eight in the second year. The staff, of course, is being increased with Thai who have studied predominately in the United States.

ARNO VIEHOEVER

September 22, 1940. Ministry of Economic Affairs, Bangkok, Thai (Siam)

I am happy to tell you that I received the October number of the American Journal of Pharmaceutical Education that you had the kindness to send me to the Chilean Embassy in New York and I hope by this time you have received the translation of the article in which you were interested. As you can see by this letter I am on the way back to my country and as I was ill during my last week in New York I could not send you the article sooner. I hope to keep in touch with you from Chile, and will send you all the pharmaceutical literature that will be of interest to you. I want to thank you warmly for your kindness and help given me and I hope to have the good fortune to again sometime come back to your nice country.

On board "Imperial",

ORLANDO CATTANI

Panal Canal Zone, December 5, 1940.

Casilla 7-D, Santiago, Chile, S. A.

I have recently read in *Newsweek* and *Time* that Henry Wallace is slated to establish relations between the United States and South America. This leads me to make a proposal to the Problems and Plans Committee. I think it should undertake to study ways and means of establishing cordial relationships between pharmacy here and there. I think this could be done by means of an exchange of professors and students between colleges there and here. Perhaps, also, it would be possible to arrange an Association meeting somewhere so that the deans of any schools in South America could attend and describe their problems and, together with us, perhaps work out a solution which would be mutually beneficial.

If you think this is a good idea, will you press it vigorously? If you wait until the August meeting and then propose it to the Association, they will appoint a committee to study it, a year later it will be accepted as a problem and another year will elapse while a committee makes a list of the colleges of pharmacy in South America, and finally, about five years from now, the Association will be ready to take some action. Obviously, five years from now will be too late. We should have some sort of plan to lay before the Association with the complete knowledge and collaboration of South American colleges this August.

JAMES M. DILLE

University of Washington.

November 28, 1940

The notice which you gave to the pharmacy program of the American Association for the Advancement of Science meeting in Philadelphia on December 28, was very much appreciated. I am enclosing a copy of the program which I feel is a good one. I know that you will not be able to use it in the next issue of the *Journal* but I shall have abstracts of the papers for you in time for inclusion therein. It is unfortunate though understandable that there is not wider interest on the part of pharmacy in the American Association for the Advancement of Science. The preparation of a program is not easy since it requires much correspondence and usually involves specific requests to qualified individuals to give a paper. Our leaders in pharmacy should be glad to promote and our scientific workers should be proud to participate in the activities of this greatest of all scientific associations. I feel that we can accomplish more for the welfare of pharmacy through the American Association for the Advancement of Science than we can through many of our own meetings.

GLENN L. JENKINS

University of Minnesota.

November 26, 1940

Thank you very much for the copy of the January issue of the *American Journal of Pharmaceutical Education*. We were interested in finding that our publication, *The Canadian Pharmaceutical Journal*, was considered of sufficient value by the author (*An Evaluation of Pharmacy Journals*,—Ralph E. Ellsworth), to be included in the survey and we are pleased to note the rating given us.

O M. HURRELL, Secretary

November 13, 1940

The Canadian Pharmaceutical Association, Inc.

The recent number of the *American Journal of Pharmaceutical Education* came in long ago and I enjoyed very much your editorial

on the American Association for the Advancement of Science and its relation to the work in pharmacy. Your earlier editorial which expressed regret was not only natural but in my opinion most useful. It does a lot of good to have from time to time a frank statement of regret and even criticism in such places. The fact that the earlier comment brought out such a response as Dille's and the new editorial is complete justification for it.

HENRY B. WARD

Past Permanent Secretary

December 19, 1940

American Association for the Advancement  
of Science.

I hesitated sending you a report of such length, but it was either that, or simply saying, "A most interesting paper was read by 'so and so' on the subject of 'this and that'." I only regret that all pharmaceutical faculty members could not be present in person, to hear the various papers in full and more particularly to be part of the Conference in spirit and thought.

HUGO H. SCHAEFER

December 1, 1940

Brooklyn College of Pharmacy.

I feel that those of us who have access to the attention of retail pharmacists are burdened with the obligation of dealing with them honestly, and we are also burdened with the responsibility of seeking to interpret fairly some of the subjects with respect to which we might be assumed to have the greater knowledge. At any rate I am convinced that modern pharmaceutical education is proceeding in the right direction, and I shall do all that I can to enlist pharmaceutical opinion in its support.

ROBERT L. SWAIN

November 22, 1940.

Editor, Drug Topics.

From One Pharmacy Dean to Another, Christmas 1940.\*

Just a little note to let you know I am thinking of you this Christmas time. At Christmas, when we take an inventory of our lives and accomplishments, I find that our friends are our greatest asset. They are values that make our life worth living and are inspirations to carry us through trying times of discouragement.

As I look at life more and more I feel that it is not really what we accomplish in life, but rather what we stand for. I am reminded of Jason Lee of Old Fort Hall. He preached the first sermon in the Rocky Mountains. At that service about sixty were present,—Indians, trappers, half-breeds, and three noted English science leaders, and a general. I do not suppose a single person was affected by the service. A man was killed that afternoon in a horse race. Yet today about the only person we know the name of in that early group is Jason Lee. It was not what he accomplished but it was what he stood for that lasted. I am hoping we the leaders in pharmaceutical education may leave a like heritage.

\*The dean who sent the above to the Journal made the following comment—"To me this seems a gem. At least it has done me a great deal of good. I wonder if it is not worthy of publication in the

Journal. If you decide to use it or any part of it, it will be most helpful if you do not tell from whom it was received or to whom it was sent. I think much of its force would be lost if either of our names were used in connection with it. I hope you can use it because I confidently feel that it is going to be helpful to some." The Editor agrees with this sentiment with the exception of the use of names. In his mind names add dignity and force to any thought expressed, especially when the author's life shows what he stands for as is true in this case.—Editor.

The following letter from Dr. Wirth to Dean Rudd is published at the request of Dean Rudd and with the consent of Dr. Wirth.—Editor.

I have just read your last installment of "An Old Timer Looks at the Pharmacopoeia" in the October (1940) number of the *American Journal of Pharmaceutical Education*, and I regret very much that you overlooked giving credit to the A. Ph. A. Committee on U. S. P. as the instigator of the U. S. P. Constitution and By-law reform.

It was this committee who labored arduously during the last four years publicising by means of questionnaires and otherwise the weaknesses of the constitution and by-laws and of the convention procedure and advocating reform. Had it not been for the work of this committee there would now be no revision of the Constitution. Of that you may rest assured.

The work of this committee during the last four years is now bearing fruit which will be of everlasting good to the Pharmacopœia and to Pharmacopœial revision, the opinion of the ex-president of the A. Ph. A. to the contrary notwithstanding.

As a member of both committees, I think you will see that the new U. S. P. Constitution and By-laws will be built around the recommendation of the A. Ph. A. Committee.

ELMER H. WIRTH  
University of Illinois.

November 14, 1940

I am in full accord with what you say regarding the attitude of the practicing pharmacist to pharmacognosy and many other subjects which are taught at colleges of pharmacy. Even the students when they complete a course wonder why they should take it to practice pharmacy. It is indeed up to us to try to show the druggists at large that our course work is of real merit to the profession. I give both you and Dr. Swain the credit for pushing this movement and I assure you that I will be very happy to forward an article within the next ten or twelve days as suggested by you. I do not think I am as versatile in presentation as some people, but nevertheless I shall do my best to express some viewpoints on the value of pharmacognosy to the pharmacist.

FOREST J. GOODRICH  
University of Washington.

November 27, 1940.

The good work is going on. Dr. Urdang has just started on a card system of encyclopedic-dictionary information for which I have been collecting material for a long life time. I wish you might see what W.P.A. assistance has made possible during the past two years.

We hope that our "History of Pharmacy" may a hundred years

from now, be considered as a worth while, though slight, contribution to pharmaceutical literature.

November 15, 1940

EDWARD KREMERS  
University of Wisconsin.

In looking over the minimum hours voted by the Syllabus Committee for Botany and Pharmacognosy, I find only 96 allotted to botany and 160 to pharmacognosy. The Sub-committees of the Pharmaceutical Syllabus in these branches recommend 144 hours of botany and I believe 208 hours for pharmacognosy. As a member of both of these sub-committees, I recall the vast amount of data which was collected and studied in order to arrive at a sound and reasonable conclusion upon the minimum hours needed for giving but a skeleton of a course in each of these subjects, which we interpreted as a minimum. To rob fundamental sciences like botany and physiology of needed minimum hours in order to increase the hours of certain applied subjects does not appear good pedagogy. The more time spent by students on the fundamental sciences of pharmacy, the easier it will be to grasp the applied work which follows. In the case of the applied and professional subject of pharmacognosy, however, hours were deducted rather than added which will mean that the teacher, in order to give his students the mere essentials in plant histology necessary to understand what he is about when he starts pharmacognosy will be obliged to use at least 48 hours of the time he is supposed to be teaching pharmacognosy in completing the students essential preparation for that course. The effect of that will be to further curtail the work in pharmacognosy or concentrate the subject matter in such a way as to make it difficult for students to grasp. The latter is obviously inadvisable. Teachers of pharmacognosy throughout the country are pretty well agreed that first year courses in academic botany do not provide the students with the training in vegetable histology necessary to pursue pharmacognosy and they are obliged to use up considerable time from the hours allotted them for pharmacognosy in getting them ready to begin that subject.

HEBER W. YOUNGKEN  
December 16, 1940. Massachusetts College of Pharmacy.

I should like to point out how the American Association of Colleges of Pharmacy is successfully fulfilling its function. The issuance of the mimeographed list of books recommended for a pharmacy library is definitely a move in the fulfillment of its function, "to promote pharmaceutical education and research." The librarians at the Brooklyn College of Pharmacy find this list most beneficial in guiding them in the purchase of over one thousand new books being added to the library this year, and desire to express their thanks to the Committee on Libraries of the A. A. C. P. The fact that such a list is available could be learned only by religiously reading the American Journal of Pharmaceutical Education—which I believe is the blood stream of the Association.

BERL S. ALSTODT  
December 23, 1940. Brooklyn College of Pharmacy.

## Notes and News

Dr. Ralph Bienfang, University of Oklahoma addressed the Oklahoma Association of Garden Clubs at Oklahoma City on November 1. His subject was Herb Gardens. The fourth Annual School for Retail Pharmacists and Sales Personnel will be held on February 19-21. Some of the topics to be discussed are vitamins, personal needs, veterinary supplies, cosmetics, profits, fountain operation and merchandising techniques. A number of films will be used in the discussion and hallway displays will be constructed according to plans sent in by druggists in the state.

At the invitation of the Cambria Somerset Retail Druggists Association, the faculty of Duquesne University, School of Pharmacy held a pharmacy clinic at Johnstown on November 21. Professors Ralph R. Kreuer and Stanley P. Porter discussed the chemistry, pharmacy and therapeutics of sulfanilamide, sulfapyridine and sulfathiazole. Dr. Elbert Voss discussed the action and uses in medicine of the female sex hormone. Dr. Charles H. Becker spoke of emulsions, considering their preparation by mortar and pestle, with a malted milk mixer and with a hand homogenizer. Photomicrographs were shown demonstrating the effectiveness of each method.

President John J. Tigert of the University of Florida has announced the gift to the University of a valuable collection of books and equipment by Dr. James H. Beal. The collection consists of approximately one hundred pharmaceutical and medical books, an analytical balance, prescription scales and chemicals. Mr. Charles R. Jordan, a graduate of Purdue University, School of Pharmacy, has been appointed associate director of the newly organized Bureau of Professional Relations in the School of Pharmacy of the University of Florida. He assumed his duties on November 1.

On November 6, Director Edward Spease spoke before a group of Alpha Phi Alumni at Oak Park on "Self-medication". On November 9, he addressed the hospital pharmacists of the state of Wisconsin at Madison and on November 19 he spoke before the Chicago branch of the American Pharmaceutical Association on the subject "Inter-professional Relations and the Duty of Pharmacists and Teachers to Carry the Subject of True Pharmacy to the Public."

The western New York branch of the American Pharmaceutical Association assisted by the pharmacy students of the University of Buffalo are engaged in a Pharmaceuticals-to-Britain Campaign. The Arner Company, Inc., have contributed a million aspirin tablets. Other large donors are the Buffalo Pharmaceutical Company, the Mu-col Company, and the Direct Sales Company. About seventy manufacturers and retail druggists have contributed varying quantities of 500 different items consisting of such merchandise as bandages, dressings, rubber gloves, hypodermics and antiseptics.

The Pittsburgh branch of the American Pharmaceutical Association has planned a series of lectures, demonstrations and discussions to furnish practicing pharmacists with fundamental information concerning newer developments of interest to them. An interesting and com-



mendable trend in the program is the amount of time given to pharmacological demonstrations of the action of drugs on the heart, the intestine, and the therapeutic and diagnostic value of dyes and stains.

A committee of the Nebraska Medical Association has drafted a bill setting up an unpaid commission to supplant the present setup in the state health department. It is proposed to have a board of five members representing the medical, dental, and pharmaceutical professions, who will have power to select the state director. The argument is that this will take the department out of politics. At present the governor has the full appointing power, but the proposal, while retaining the power in him, limits his choice to a list submitted, and requires legislative confirmation.

Through the courtesy of Colonel Robert C. McDonald, chief of the hospital staff and Sergeant Boese, pharmacist in the dispensary, the seniors in the School of Pharmacy of the University of Kansas have recently completed a brief tour in the army hospital at Fort Leavenworth. In an attempt to give the senior students some idea of how pharmacy is conducted in the army, two or three of them have been taken to the post dispensary early on Saturday mornings during the fall semester. Two hours have been spent in studying stock and records. Prescription files dating back to 1886 were opened for inspection by the students who were impressed by two very significant facts; first, that the metric system really is the official system of the army, and second, that only official Pharmacopœial and National Formulary materials are used in filling the prescriptions written by the regular army officers. Then Colonel McDonald allowed the groups to accompany him on his regular morning inspection which requires slightly more than an hour and which covers everything from guard cell to the morgue. The students have been much impressed by the extensive stock of drugs and other supplies, and by the very complete clinical laboratory which does analytical work for the entire area. Frequently three hundred prescriptions are filled daily. The work is expected to increase rapidly as the number of draftees increases and the seniors will then be permitted to work in the dispensary. Don Fortney, a 1940 graduate, is now employed in the dispensary. Arrangements have also been made with the School of Medicine for the senior students to spend one week each semester in the hospital pharmacy at the Bell Memorial in Kansas City. This is a valuable experience for the students, for each one has the opportunity of two weeks hospital work. Roy Boyle, 1929, is chief pharmacist at the Bell Memorial, and Jack Robertson, 1940, is his assistant. Through the efforts of Mr. J. A. Searcy, a druggist of Leavenworth, Kansas, and a graduate of the University of Kansas, School of Pharmacy, 1903, a course under the direction of Dr. L. L. Boughton has been established in the Medical School for the students of the sophomore year. The course covers the arithmetic of the prescription and a discussion of the more important drugs and chemicals that the physician uses. Prescriptions from the hospital files are thrown on a screen and discussed so that students may have some conception of what to do and what not to do in writing them. The value of team work between the druggist and the physician in the interest of better service and the protection of community health

is stressed. Such a course should be of great value in bringing about an understanding of the aims and policies of both professions.

Eight undergraduates and alumni of the School of Pharmacy of the Oregon State College have entered the various branches of the military service, having been placed in active duty for one year. The Oregon State College Pharmaceutical Association is sponsoring weekly meetings during the current school year. The programs serve as a stimulus to a better understanding of pharmaceutical problems and their relationship to public welfare. In the absence of President Frank L. Ballard, who is on leave because of illness, Dr. F. A. Gilfillan, formerly professor of pharmacy and now dean of the School of Science, has been appointed chairman of the college administrative council and acting president. The last legislature made available a substantial sum of money for improvement of the state owned radio station at Corvallis. The Oregon State College hour is a daily feature, except on Sunday. The pharmacy broadcast is sponsored twice a month, when faculty members discuss timely topics pertaining to pharmacy.

The Colorado-Wyoming Academy of Science held its annual meeting at Laramie, Wyoming on October 18 and 19. Drs. J. B. Sprowls and C. F. Poe, of the College of Pharmacy of the University of Colorado gave a paper on "A Bacterial Study of Antiseptic-Astringent Combinations" and Mr. C. C. Johnson and Dr. Poe gave one on "Toxic Action of Alkaloids on Bacteria and White Rats."

A photographic club has been organized at the Connecticut College of Pharmacy. The purpose is to instill into its members knowledge which will be of value in merchandising photographic material as well as to cultivate through practice and competition, the sense of the artistic.

Fordham University announces the recent addition of many new books and journals to the pharmacy library. Also, that Dr. Otto F. A. Canis has been elected president of the New York board of pharmacy and Dr. L. J. Piccoli has been reelected president of the American Association of Professional Pharmacists.

Winners of undergraduate awards for scholastic excellence during the past year at the Philadelphia College of Pharmacy and Science are Samuel Lesitsky, Milton Perloff, William Sieber, Eric Martin, Martin Yanishevsky, James Hetrick, Herman Milner, Daniel Kacker, Rose Peterson, Grafton Chase, and Peter Bogarosh. A three-day seminar on modern pharmaceutical practicing for retail druggists will be conducted by the members of the faculty beginning on January 27.

A nine-member advisory committee of Wayne University faculty members has been appointed by Dr. David D. Henry, executive vice-president, to work with the American Council on Education in the coordination of university activities with the national defense program. Members are Dean Roland T. Lakey, college of pharmacy; Prof. Ernest B. Drake and Prof. Charles W. Selheimer, Jr., engineering; Prof. Edna Plambach, nursing; Prof. Arthur L. Amolsch and Prof. Osborne A. Brybes, medicine; Mr. Donald S. Hecock, government; Prof. George W. Carter, physics, and Prof. Vaughn S. Blanchard, health education.

During the last year fourteen new buildings and a stadium costing approximately \$1,500,000.00 have been completed on the campus of the

Alabama Polytechnic Institute. The Department of Pharmacy of the Institute announces the addition of a large assortment of books to the library. J. E. Cox was awarded the Rho Chi key for the highest scholastic average in the freshman class for the year 1939-40. The Rho Chi society is also sponsoring the student branch of the American Pharmaceutical Association.

The School of Pharmacy of George Washington University has received the personal library bequeathed to it by the late Albert F. Gorsuch, a prominent pharmacist of the District of Columbia. The Mortar & Pestle Club won the prize given annually to the campus organization which has the best percentage of its quota in the drive for food and funds. Theodore K. Twigg, a sophomore, was recently elected vice-president of the university band. George O. Chilcoat, a junior, is on the staff of the Hatchet, the university paper.

Students of the University of Michigan, College of Pharmacy have recently organized the Apothecary Club, which will sponsor various educational and social functions. The faculty advisor is Prof. C. H. Stocking. Recent Phi Kappa Phi initiates are William M. Austin and Marjorie A. Kern.

R. J. Stevenson, a sophomore student in the College of Pharmacy of the University of Texas, has been selected as Lieutenant-Commander of the recently organized R.O.T.C. midshipmen at the University. Three recent graduates have passed the examination for the Medical Administrative Corps and are now engaged in instructional work appertaining to the pharmaceutical service. John Slaughter, 1940, is in the air service at Lindberg Field, San Diego. Seven pharmacy students have been called to the National Guard and nine others have volunteered in the Army. Sam Weaver, senior pharmacy student, has been elected president of the University of Texas band. The student branch of the American Pharmaceutical Association has a membership of 212. Miss Etta M. McDonald, winner of the Fairchild Scholarship in 1940, has returned to the College of Pharmacy to engage in research work on Brucellosis.

Professor and Mrs. Esteban Nunez-Melendez of the University of Puerto Rico are spending this year doing advanced work at the School of Pharmacy of the University of Florida. Mrs. Nunez-Melendez is also a pharmacist and formerly operated a store of her own in the Island.

Dean B. V. Christensen, Dr. Earl P. Guth, and Dr. L. David Hiner have been initiated as honorary members of Phi Delta Chi at Ohio State. Equipment has been installed in the new manufacturing laboratory and instruction is now being given in this phase of pharmacy. The opportunity for seniors and graduate students to carry out and observe the techniques of large scale production methods and control procedures is a forward step in pharmacy at Ohio State. Upon the occasion of the inauguration of Dr. Howard Landis Bevis into the presidency of the Ohio State University, the pharmacy students had the opportunity of hearing the subject, "The University and the Professions", discussed by Dr. Roscoe Pound of Harvard, and Dr. Morris Fishbein of the American Medical Association. Both men stressed the point that a profession is a group of specially trained individuals banded together for the purpose of rendering service. Service alone as its goal, separates the professions from the trades wherein monetary

gains are the prime objectives. At a meeting of the College of Pharmacy, a guest speaker from the department of journalism spoke to the group on "Pharmacy and Journalism." The topic assumed momentous proportions when the speaker fulfilled the desire we all have to see ourselves as others see us. He commended our profession but scored the pharmacists heavily for depending upon strangers for the kind of publicity which is constructive. When this is done we usually get the joking type of publicity which is malicious. He stated that there is a need and a place in journalism for pharmacy students. This, it seems, is worthy of some serious thought upon the part of the deans of our colleges of pharmacy.

About one hundred new volumes have been added to the Connecticut College of Pharmacy library. This was made possible in part by funds donated by the Traveling Men's Auxiliary of the Connecticut Pharmaceutical Association. A gift of the latest edition of the Encyclopedia Britannica has been received from Dr. A. L. Omohundro of Bridgeport. Prof. Leslie B. Barrett spoke before the students of the Central High School in Bridgeport during the National Pharmacy Week on "The History and Romance of Drugs." Dr. Grace Mooney, of the New Haven Department of Health, has been added to the staff and will be in charge of the courses in bacteriology and public health. Dr. Mooney is a graduate of the School of Public Health of Yale University. Formerly she was connected with bacteriology and similar departments at Western Reserve University and at Yale Medical School.

Dean Emeritus W. J. Teeters of the College of Pharmacy of the State University of Iowa was named presidential elector at the state republican convention in July. Lucille Yowell has been appointed to the staff of the University libraries and assigned to the pharmacy-chemistry-botany departmental library. Miss Yowell had training in library sciences in the University of Illinois. A student branch of the American Pharmaceutical Association has been established. Eighty-three signed the petition and pledged themselves to become active members.

The Ladies' Auxiliary of the Florida State Pharmaceutical Association has recently contributed \$50.00 to be used in the purchasing of new books for the School of Pharmacy of the University of Florida. On December 16, the Florida Rho Chi chapter initiated six new members. They are Bernard Jatul, Murray Bennett, Roberto Gelpi, Carl H. Johnson, and Mr. and Mrs. Esteban Numez-Melendez. Dr. Oscar A. Rossi, a member of the pharmacy faculty of the University of Buenos Aires, has been awarded a scholarship by the Argentine government for advanced study in pharmacy. Dr. Rossi will work at the University of Florida. He is accompanied by Mrs. Rossi. They plan to remain the entire year.

George E. Crossen, instructor in pharmaceutical chemistry and Allen I. White received the Ph.D. degree (pharmaceutical chemistry) at the fall quarter commencement of the University of Minnesota. Dr. White is now an instructor at the State College at Pullman, Washington. Because of increased enrollment alterations have been made to provide a new manufacturing pharmacy laboratory to accommodate twenty students. Two additional faculty offices and research rooms have also been provided.

An award of twenty-five dollars has been established by Mrs. Agnes Leahy Sutherland of San Diego, California to be given to a student at Creighton College of Pharmacy who is outstanding in scholarship, extra curricular activities, loyalty, and character. Mrs. Sutherland was graduated in the year 1907. The award this year will be in the form of a set of reference books and journals. The request in the October, 1940 issue of the American Journal of Pharmaceutical Education for missing issues of the publications of the American Pharmaceutical Association met with a liberal response. Journals were received from the Nebraska College of Pharmacy, Iowa State College of Pharmacy and inquiries which may lead to eventual exchanges were made by the University of Georgia and Connecticut College of Pharmacy. Permission for establishment of the Alpha Alpha Chapter of Rho Chi, Honorary Pharmaceutical Society, was granted the Creighton College of Pharmacy in December. The National Secretary-Treasurer of Rho Chi, Dr. Harris, of the University of Oklahoma, has notified the College that the necessary number of affirmative votes had been cast by the member chapters in favor of the petition for establishment of the new chapter. Plans are under way for an early initiation of the charter group.

Dean Hugo H. Schaefer of the Brooklyn College of Pharmacy has been appointed by Mayor La Guardia as an active member of the Official Advisory Health Preparedness Committee of New York City. This Committee is to determine the health needs, utilize the health resources and insure the health protection of the worker engaged in the field or factory and the population as a whole in the City of New York. The committee is an integral part of the health phase of the general preparedness program carried on by the Defense Councils and the State Defense Coordinator. Leslie C. Jayne, former assistant professor of chemistry at Columbia University, College of Pharmacy, engaged for the past few years in pharmaceutical research, has been appointed to the faculty of the Brooklyn College.

At the School of Pharmacy of the University of South Carolina two new air-conditioned laboratories have been equipped for dispensing and analytical pharmacy. The dispensing equipment is of the latest design and a modern fluorescent lighting system has been installed. A weighing room with new equipment, new stock rooms and well lighted glass display windows for practical work in window trimming have been provided. The library has been enlarged and many new books added. Missing numbers of periodicals whenever possible have been replaced and bound.

The students and faculty of the School of Pharmacy of the University of Buffalo in cooperation with the alumni in western New York carried out an extensive program during Pharmacy Week. Six radio programs were given on as many days. The subjects dealt with various phases of pharmacy work and professional relations. The pharmacy students also placed professional window displays in the stores throughout the western part of the state.

Dean Hugh C. Muldoon was elected second vice president of the American Science Teachers Association at the recent meeting of the American Association for the Advancement of Science at Philadelphia.

## Miscellaneous Items of Interest

### Memorials

#### **MRS. ROY BIRD COOK**

Many men have been connected with the drug business in the United States who have stood for the highest type of ethics in the profession. Among those who have rendered outstanding service is Dr. Roy Bird Cook of Charleston, West Virginia.

The readers of the Journal know Dr. Cook and his work. However, it has been the privilege of only a few people to know personally the quiet, intelligent, unassuming, charming wife who has stood by his side for 33 years and encouraged him in his efforts in many fields of endeavor.

Nelle Williams Camden, a member of a distinguished family in West Virginia, became Mrs. Roy Bird Cook on August 23, 1907. She died on December 3, 1940. During the period of her last illness which extended over several years, Dr. Cook spent every available moment at her bedside and granted every whispered wish. They were truly a devoted couple who shared each other's dreams and ambitions.

Those who had the privilege of knowing Mrs. Cook will always retain memories of the splendid spirit she possessed, the excellent disposition she always manifested, and the whole-hearted devotion she gave to her husband and three charming daughters.

Phil Conley.

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#### **CHARLES H. GAUGER**

Charles H. Gauger, assistant professor of pharmacy in the School of Pharmacy of the University of Buffalo, died suddenly on September 28, 1940, while resting in the back yard of his home. Mr. Gauger was born in Rochester, New York, on July 21, 1868. He received his early education in the public schools and the German-American Institute of his native city. He entered the School of Pharmacy in 1888 and was graduated in 1890 and a year later was appointed a laboratory assistant in pharmacy. During the years that followed he also conducted a retail pharmacy in Buffalo, but in 1919 he disposed of his store in order to devote all of his time to his teaching duties at the University. In 1928 he was promoted to an assistant professorship and upon the death of Dean Gregory in 1937 he became acting head of the department. He served two terms as a member of the state board of pharmacy, one term as president. On April 17, 1940 he was awarded the Gregory medal on the completion of fifty years as a pharmacist and twenty-five years of service to the University. The medal is awarded annually to the western New York pharmacist who best personifies the ideals of service and integrity of the profession. He was a member of the American Pharmaceutical Association, New York State Pharmaceutical Association, and several local drug organizations, a Mason, and a member of the Lutheran Church. His



many years of practical experience gave him a fund of information which was constantly being tapped by his students as well as by his colleagues. He was noted for his kindly and patient handling of student problems. He left an indelible mark upon the character of every student who came under his tutelage. No finer tribute can be paid to any man.

A. B. Lemon.

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### **WILLIAM GOGGIN CROCKETT**

These lines are written in tears—mingled tears of family, faculty, friends, students and alumni of the Medical College of Virginia, pharmacists throughout the State, and many others everywhere who knew and loved him.

A native Virginian, born in Tazewell, January 9, 1888, the son of the late John Ward and Mary Grace Crockett, he attended local schools and was prepared for college at Bedford City Academy. After attending Hampden-Sydney, he studied pharmacy at Columbia University where he was awarded the Doctor of Pharmacy degree, and received his Master's degree from New York University in 1917. For a year he was assistant in chemistry at that institution, and then entered the Research Division of the Chemical Warfare Department at the American University Experiment Station and served as first sergeant. He had experience in the New York City Board of Health laboratories, and with both E. R. Squibb & Sons' and with the Du Pont Company in Wilmington.

In his early years he had considerable retail drug store experience with the beloved John E. Jackson of his home town, and to whom he was truly devoted. After the war he was Professor of Pharmacy for a year at Baylor University in Texas, coming from there to the Medical College of Virginia in the summer of 1920. His work at the College for the past twenty years is too well known to need much comment. It sufficeth to say that in the judgment of the writer, we have had during these years the best Professor of Pharmacy in this country. Faculty, students and alumni loved him with a devotion that we have rarely seen equaled. His going is the loss of a great friend and wise counselor.

Honors in large numbers came to Dr. Crockett. As chairman of the Virginia Section of the American Chemical Society, and later editor of the Section's Bulletin, he made a definite contribution to this organization. His year as president of the American Association of Colleges of Pharmacy was eminently successful. From 1920 to 1930 he was a hard working and highly efficient member of the United States Pharmacopœial Revision Committee.

In 1939, Hampden-Sydney conferred upon him the degree of Doctor of Science, and only this year he was among the small group of Richmonders admitted to *Who's Who In America*.

He was a frequent contributor to the pharmaceutical press, and his little book, *Saved by the Bell*, just published but which was written for the most part during his long illness a few years ago, is a gem of quiet humor—a quality for which he was well known.

He was a member of the American Association of University Professors, a fellow of the American Association for the Advancement of Science, a member of the American Chemical Society, the American Pharmaceutical Association, and the Virginia Academy of Science. Also, he was a member of Pi Kappa Alpha, Kappa Psi, Rho Chi, Sigma Zeta, and a Mason.

In 1919, he married Miss Ethel May Dulin, who, with one daughter, Mary,—a freshman at Westhampton College—survive him.

The writer may be permitted a personal word. For twenty years he had the privilege of working with Dr. Crockett, occupying adjoining offices. During these years, no College policy of any consequence has been adopted that had not been carefully gone over and approved by him. No letter nor article of consequence was ever written by us that did not carry his approval. We shall miss him as we have missed few through all the long years. While his college work will go on, his place can never be filled. Quiet, fair, loyal, thoughtful, kind, efficient—we shall hardly see his like again.

Wortley F. Rudd.

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### **CHARLES JOSEPH FUHRMANN**

On Thursday morning, January 2, 1941 the career of Dr. Charles Joseph Fuhrmann came to an end; he died following a heart attack. Retirement on June 30, 1938 as Acting Dean of the College of Pharmacy Howard University did not terminate his services with the University. Only when out of the city was Dr. Fuhrmann ever away from the college for more than two or three days. His advice and wisdom was of constant value to those of this college up to a few days prior to his death.

Dr. Fuhrmann was born in Kalamazoo, Michigan October 17, 1871 and obtained his early education in the public school of that city. Coming to Washington as a young man in 1891, he worked in the United States Government Printing Office, leaving there as a division foreman in 1906. While employed in the Printing Office he studied Pharmacy at the National College of Pharmacy (now George Washington University College of Pharmacy), and received the degree of Doctor of Pharmacy in 1901. In 1900 and 1901 Dr. Fuhrmann served as assistant to Dr. Wyman H. Bradbury, Professor of Pharmacy at the National College of Pharmacy. In 1901 Dr. Fuhrmann opened a drug store which continued until 1922 when he came to Howard University as Professor of Pharmacy.

Dr. Fuhrmann served as Vice Dean of the College of Pharmacy during the period 1926-1937 at which time he was automatically retired because of age, and was made Acting Dean for the year 1937-1938 until a new administrator could be appointed.

Our affection for Dr. Fuhrmann may be best illustrated by a paragraph from a letter written to him by President Johnson one month prior to his retirement, "It seems hard to realize that your period of active duty as Dean of the College of Pharmacy has come to a close. Your loyal and cheerful devotion to duty during the entire

period of my administration has been a source of constant strength and inspiration to me. In your spirit and in your work you have been and you are a blessing to Howard University . . . ."

The following passages taken from Dr. Fuhrmann's Annual Report, June 1937 to the Trustees of the University present definitely and clearly his ideals and objectives relative to pharmaceutical education:

"There is no question about the upward trend of pharmacy. The commercial invasion has not affected its scientific and professional status, but only the functional aspect represented by so many commercialized drug stores. Because of their neglect of pharmacy, their emphasis upon trade, and the glitter and ostentation, some, even professional persons, reach the erroneous conclusion that this kind of commercialized drug store represents pharmacy.

"Against such opinions can be arrayed the judgments of well-informed and fair-minded persons who see in the situation a justification to help pharmacy rather than retard it. Colleges of pharmacy should have no interest in the over commercialized drug store. Their responsibility is to foster the kind of education and training that will attract to pharmacy only such recruits who aspire to a strictly professional practice.

"The College of Pharmacy of Howard University has been a leader and now stands practically alone in Negro pharmaceutical education. We trust it will continue because the Negro public has a right to expect continual improvement in the service which the Federal Government makes possible through Howard University.

"Pharmaceutical service does not include trade practice. It is the duty of the College of Pharmacy to emphasize, through adequate courses for the preparation toward professional practice, the professional practice, the professional and health aspects of pharmacy. We must not permit any attempt to minimize our right and importance in Negro Health Service by any other professional public health group without earnest protest and demand for full hearing."

In 1894 he married Mary C. Brewer of Washington, D. C., and enjoyed his family of four sons, one daughter, seven grandsons, and one granddaughter.

Dr. Fuhrmann was well established in the profession of pharmacy in the District of Columbia. From 1910-1920 he served as Secretary-Treasurer of the District of Columbia Board of Pharmacy; Secretary of the District of Columbia Pharmaceutical Association for twelve years; President of the District of Columbia Veterans Druggist Association of which he was a charter member; member of the American Pharmaceutical Association; ten years a member of the Board of Directors of Casualty Hospital; District of Columbia general agent for the American Druggist Fire Insurance Company since 1941 and held life membership as an honorary member of the National Association of Boards of Pharmacy.

Through the guidance, inspiration and courage of Dr. Fuhrmann, the College of Pharmacy of Howard University has grown and prospered. He was instrumental in converting totally inadequate quarters into modern, well-equipped laboratories, classrooms, and offices. By constant struggle and improvement the College of Pharmacy was ad-

mitted to membership in the American Association of Colleges of Pharmacy in 1926. Dr. Fuhrmann maintained an untiring interest in Pharmaceutical Education and advancement at Howard University.

Chauncey I. Cooper.

### HENRY HURD RUSBY

When a life-long friend departs from this earthly environment, one must depend upon a sound philosophical and spiritual conviction born of a deep and unalterable faith in the efficacy and justice and wisdom of the Divine Plan, if one is to say with sincerity, "Lord, Thy will be done". Such convictions gave me a fortitude which rescued me from an overwhelming grief when the news of the passing of Dean Rusby at Sarasota, Florida, reached me on November 18, 1940. But it is entirely selfish to lament our own loss when we should rejoice in a friend's relief from years of illness and suffering and in his advent into realms of peace and bliss. This was the attitude of the Dean's family whose qualities were comparable to his own. Dean Rusby's family life was a happy one. Harmony, order, mutual helpfulness and thoughtfulness; the impelling force of love to make each other happy, and the constant concern of each member for the welfare of the other, were characteristic of this family, whether in times of good fortune or in adversity. He frequently spoke of the care and devotion given him in his years of sickness and pain. He freely acknowledged that without the inspiration of his family and the haven of rest which his home was, he could not have lived so active and fruitful a life.

One persistent and driving motive and purpose ran through his life and work: to render a distinctive service toward the improvement and welfare of pharmacy and related fields, especially of pharmaceutical botany and materia medica. In these fields he was versatile and paramount among pharmacists, and as an explorer he was an outstanding man. His writing on his exploratory work and adventures, especially his *Jungle Book*, are unexcelled in our profession. His professional work endeared him to a host of students and graduates. To be a student of Dean Rusby was always regarded as a great privilege and advantage. His researches, scientific attainments and achievements, his efforts toward the advancement of educational and professional ideals and standards, his effective participation in the establishment of reasonable drug and food standards and his many other prolific activities through a span of life continuing fifteen years beyond the proverbial three score year and ten, are well known to his contemporaries, and should be more fully recorded for posterity and the glory of pharmacy, by a competent and sympathetic biographer. His contributions to science and his outstanding place in science and pharmacy brought to him all the honors in the gift of pharmacy. Among the outstanding marks of recognition of his services to the profession and of his place in it, special mention should be made of the honorary Doctorate of Science from Columbia University, and the Remington, the Hanbury, and the Flückiger medals. He is the only pharmacist to whom such high distinction has come.



A Part of the Faculty of the College of Pharmacy of the City of New York, Columbia University, 1888 or 1889. Seated, left to right:  
Dr. Henry H. Rusby; Dr. Chas. F. Chandler; Prof. F. W. Bedford; Dr. A. H. Elliott.  
Standing, left to right: Dr. Henry Kraemer; Dr. F. J. Wulling; Dr. Geo. A. Ferguson.

Dean Rusby was a man of many fine qualities and noble traits of character. He was a persevering and tireless worker, and discriminating in the selection of his work. His culture and cultural background, his kindness, gentleness and thoughtfulness, friendly approach, tolerance and attainments brought him a host of friends and admirers. He had other qualities too, less affirmative ones, but they were always expressed in the pursuit of some worthwhile objective, or one which he was convinced needed his uncompromising support. He made enemies on the other side of many controversies. With these he was relentless and unyielding. Although he was exceedingly practical in most respects, he never compromised with selfish interests in matters affecting deviation from high standards, especially of drugs and medicines. In these matters he was militant and did not spare his antagonists, because he felt convinced consideration and appeasement were fruitless. He sometimes allowed his controversies to rob him of rest and peace. Then it was he sought the woods and lakes of northern Minnesota and with rod and reel he became the delightful comrade and friend. Dean Rusby was historically minded. Through his knowledge of the past he evaluated the present, of which possibly he expected too much. The unrealized results of some of his work will enrich the future. He was very sympathetic with an endeavor to establish a representative historical pharmaceutical museum at the University of Minnesota and frequently contributed to it. Dean Rusby's warm and intimate friendship, his sympathetic and helpful support of my endeavors and aspirations, and the delight he took in my work through fifty-two years, greatly enriched my life, as I know he enriched the lives of others. I no longer selfishly mourn his loss; rather do I rejoice that he now transcends this early arena. Since it is the will of God, I freely surrender my friend to a higher world.

"For ye are all sons of God." Gal. 3:26.

Frederick J. Wulling.

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## What University Heads Are Saying To Students

Again we launch a new college year with enthusiasm and high hopes. Only in America is this now possible, with the rest of the world in chaos. We should appreciate and make best use of our unique opportunities. We must and shall be ready to answer the call to defend our liberties and opportunities if the holocaust now raging on three continents should be brought to our shores. In the meantime, until the threatening clouds may become darker or may be cleared, we have been urged by national leaders to continue our constructive educational programs. At the present time we can serve our country best by devoting ourselves wholeheartedly to our educational pursuits. Here is hoping that they will not of necessity be interrupted!

Chancellor C. S. Boucher, University of Nebraska,  
from *The Daily Nebraskan*.

Our institutions of higher learning occupy a supremely important place in the lives of the American people. More than a million and a



half of the promising youth of the nation are beginning a new college year. It would be tragic if they were to start the year's work with no appreciation of the problems ahead of the nation and no sense of responsibility of their obligations to our democratic society. Faculty members and students alike should begin this year's work in a spirit of soberness and earnestness that they have never felt before. It behooves all of us to resolve to make the most of our opportunities to the end that we may be prepared to serve our country either in time of peace or in time of war. In this state of mind only can we justify the faith of the people of the United States in our institutions and merit the confidence of all right-thinking Americans who love our country and cherish its ideals.

President W. B. Bizzell, University of Oklahoma,  
from School and Society.

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## The Problem of Accrediting

In the October 1940 number of the Educational Record, Dr. Ernest V. Hollis who is associate for college teacher education of the Teacher Education Commission of the American Council on Education, discusses in an article entitled Comprehensive Qualitative Accrediting, the methods which the scholastic world is now using for the purpose of accrediting membership standards. In the past quantitative standards have been used. Now there is a tendency towards the *"use of qualitative criteria and evaluation procedures which rate the institution in terms of its own statement of philosophy and objectives."* The paper is an exploration into the procedures now being used by different accrediting agencies for the accrediting of secondary schools, colleges and universities, and professional and technical institutions. Below we quote the reference made to the work of the American Council on Pharmaceutical Education in evaluating and accrediting colleges of pharmacy:

Since August 1937 the American Council on Pharmaceutical Education has "used both qualitative and quantitative criteria in determining the acceptability of a college for accreditation." The professional associations of the practitioners, professors, and state examiners were aided in the preparation of these standards by "the American Council on Education and the departments of education of some of the states interested in advancing pharmaceutical education." The official statement continues with a summary concerning qualitative criteria:

Qualitative evaluation has been done in part through information from questionnaires and in part through visits of inspection by committees consisting of at least two members of the council. The qualitative criteria include; (1) qualifications, experience, scientific or scholarly publications, and professional contacts of the members of the faculty; (2) quality of instruction in pharmacy departments and in cooperating departments; (3) scholastic records of students; (4) extracurricular participation in local and state pharmaceutical organizations; and (5) attitude and policy of the administration towards teaching and research.

Out of the 70 colleges of pharmacy in the United States, 62 made application for accreditation and 54 were evaluated and accepted. Four of those accepted are designated for reinspection in 1942 and the others are considered accredited until 1944.

## Considerations for Possible Deferment of Men in Science

This statement, prepared jointly by the National Academy of sciences and the Sub-committee on Military Affairs of the National Committee on Education and Defense, is in response to the following request from Dr. C. A. Dykstra, Director of the Selective Service System:

Under the operation of the Selective Service Law, it is contemplated that university presidents and heads of industrial laboratories will request the deferment of certain individuals in the interests of national defense. As many of these requests will be concerned with men in the sciences, you . . . are in a unique position to express an opinion of value to these administrative officers. . . .

It will be of aid if you will express your opinion as to the present and probable future personnel needs in those several scientific branches where a shortage of competent personnel is likely to exist and endanger the national interest "in the sense that a serious interruption or delay in such activities is likely to impede the national defense program."

Although I realize that I am asking a difficult question, I nevertheless hope that I may have a reasonably prompt reply.

Statement:

Both because your letter asks for a prompt reply and because the entire structure of the defense program is not yet sufficiently developed to indicate the full extent to which scientific personnel should be exempted temporarily or permanently from military service, it is impossible at this time to express an opinion as to the whole field of fundamental and applied science.

All that this statement attempts to do therefore is to cover those fields of science in which the conditions seem clearly to indicate the general course that should be pursued in the best interests of the national defense program. As to the other fields of science, supplementary statements may be issued as soon as they can be more thoroughly studied from the standpoint of general procedure. Individual cases for deferment undoubtedly exist in all of them at the present time and more will develop as the defense program expands.

Experience of every nation engaged in the World War and the conditions under which the present conflict in Europe is being waged point directly to the necessity for proper employment of scientific personnel and of those competent to train such personnel, to a continuous supply of newly trained personnel, and to the penalties incident to assigning them in large numbers to purely military service where

others without their special training can function equally well. At the moment, the fields of science in which the present and prospective personnel situation in relation to the needs of the defense program clearly require careful consideration of requests for deferment by both university presidents and heads of industrial laboratories are as follows:

1. Medicine, dentistry, and pharmacy.
2. Biology, bacteriology, and any branch of biological science which bears directly upon problems of medicine or the public health, safety, or interest.
3. Chemistry.
4. Physics.
5. Geology and geophysics, including such specialized fields as meteorology, hydrology, and cartography.
6. Engineering, including civil, electrical, chemical, mechanical, agricultural, sanitary, and mining.

You request advice which will be of assistance both to university presidents and heads of industrial laboratories. Their problems of deferment are similar although not identical. The college and university is concerned both with the training of men and in the conduct of fundamental research. The industrial laboratory is concerned primarily only with the conduct of research.

So far as college and university presidents alone are concerned, questions of deferment of both students and faculty are involved in all six fields.

In the training function, the institutions vary as to the extent of specialization in the areas above. Recommendations for deferment should be made for students only in those fields in which the institution is adequately equipped both in personnel and facilities to provide an adequate and comprehensive educational program.

Until July 1, 1941, the situation as to students in science, both undergraduate and graduate, appears to present no immediate problem in view of (4f) of "Selective Training and Service Act of 1940." If further deferment beyond July 1, 1941 for students (particularly graduate) is made possible it may present no special problem.

An exception requiring immediate determination for permanent exemption of students from military field service until after graduation may exist in certain fields, e.g. medicine, dentistry, and pharmacy, where there will be large demand for trained men in both the military and civil sectors, and where, because of the character of the training required, a deficiency of supply of qualified personnel cannot be made up by extensive specialized training.

Deferment should be requested for advanced undergraduate and graduate students who, in the judgment of the college and university administrators, will be specially qualified to contribute to the defense program if permitted to complete all or a major part of their study before entering the military establishment or a defense industry, or who are required to replenish a depleted instructional staff. Such requests should be on an individual basis and only for those in good standing, majoring in the respective field, and who have completed at least two years of college.

In all six fields university presidents should request deferment of

members of the teaching staff who in their judgment are essential properly to maintain the efficiency of the institution in the continuous training of students necessary in the operation of the defense program or in the effective conduct of research and development problems assigned to the institution in connection therewith.

The industrial laboratory and some graduate schools employ trained personnel often in group or team operations which require not only highly skilled individual scientists and engineers but likewise men accustomed to working together in close cooperation. Subtraction of a single key man from such a group may seriously handicap or even substantially destroy the efficiency of the group to function. The problem of the industrial and university research laboratory concerned with a present or prospective defense program is not only one of retaining an adequate number of highly trained research men, engineers, and skilled technicians but also one of maintaining the integrity of research and development teams. This is because industrial research and development is a coordinated group activity.

Research directors should request deferment of highly qualified men whose training and experience are such that their withdrawal will cripple the ability of the laboratory to function effectively in the defense program.

In addition to trained scientists and engineers, the industrial and university laboratory is largely dependent on skilled craftsmen, such as draftsmen, instrument makers, etc. Request for deferment of skilled men in these categories is indicated unless they can be replaced.

For the National Academy of Sciences

Frank B. Jewett, President

For the Subcommittee on Military Affairs

Isaiah Bowman, Chairman

From Bulletin No. 6, December 7, 1940.—Issued by American Council on Education.

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## Program and Abstract of Papers Presented before the Subsection on Pharmacy at the Meeting of The American Association for the Advance- ment of Science, Philadelphia, December 28, 1940.

1. HETEROCYCLIC DERIVATIVES RELATED TO SULFANILAMIDE. Glenn L. Jenkins and Harold Urist, University of Minnesota, Minneapolis, Minnesota.—The authors described the successful synthesis of 8-aminoquinoline-5-sulfonamide which is the quinoline analog of sulfanilamide.
2. A PHYTOCHEMICAL STUDY OF THE FRUITS OF CHENOPodium ALBUM L. J. Tomato and K. L. Kaufman, Medical

College of Virginia, Richmond, Virginia.—The authors concluded from a phytochemical study of *Chenopodium album* fruits that the drug contained little if any ascaridole. They reported the isolation of a number of other constituents.

3. **SYNTHESIS OF A-KETOHYDROXIMIC ACID CHLORIDES.** Walter H. Hartung and N. Levin, University of Maryland, Baltimore, Maryland.—The authors described the synthesis of ketohydroximic acid chlorides which are used as intermediates in the preparation of phenylethanolamine derivatives employed in therapy to increase blood pressure.
4. **NEW MAGNESIA DEVELOPMENTS FOR PHARMACEUTICAL USE.** W. N. Doushness, J. T. Baker Chemical Company, Phillipsburg, New Jersey.—The author discussed the use of normal magnesium carbonate which mixed with certain organic acids yields a "powdered magnesium citrate" that gives clear sparkling effervescent solutions when dissolved that meet the requirements of the official Citrate of Magnesia. He also described a compound formed from normal magnesium carbonate and acetylsalicylic acid which may possess advantages as a medicinal agent.
5. **EXPERIMENTAL STUDIES IN MACROMOLECULAR PATHOLOGY.** W. C. Hueper, Warner Institute for Therapeutic Research, New York City, New York.—The author showed that various pathological conditions result from the parenteral administration of macromolecular compounds such as poluvinyl alcohol, methyl cellulose, and gum acacia. These substances disturb the equilibrium of the colloidal, macromolecular constituents of the blood and give rise to a reduction in the number of erythrocytes and in the amount of hemoglobin, persistent leucocytosis, increased coagulation speed, lengthened bleeding time, etc. Such symptoms are characteristic of several storage diseases, e.g., amyloidosis. Similar reactions of the blood in allergic and immunity states may have a macromolecular origin resulting from the presence of antigen-antibody complexes.
6. **APPLICATIONS OF AN IMPROVED METHOD FOR MEASURING TEMPERATURE.** J. C. Munch, G. C. Henry, and H. J. Pratt, Temple University, Philadelphia, Pennsylvania.—The authors reported modifications in the thermocouple methods of measuring and recording temperature. Two machines were illustrated. One of these was used to determine the skin temperature after application of ointments and the other for measuring bronchiolar temperature.
7. **ACETANILID STUDIES II. CHRONIC TOXICITY.** J. C. Munch, L. M. Phillips, and S. P. Garrett, Temple University, Philadelphia, Pennsylvania.—The authors studied the effects of acetanilid on humans under controlled conditions. They concluded that the chronic toxicity of acetanilid is very low since relatively enormous quantities are required over long periods of time to produce detectable injury in normal individuals.
8. **HYDROQUINONE ACHROMOTRICHIA AND THE MOUSE ANTIALOPECIA FACTOR.** G. C. Martin, Warner Institute of

Therapeutic Research, New York City, New York.—The author produced the alopecia syndrome in black mice by a modification of the diet of Wooley. This is characterized by loss of hair over the entire trunk. No greying of the hair is seen before it falls out. When fed rice polishings the weight increases and the hair grows in again but in about 20 per cent of the cases the new hair is grey. The same strain of mice fed hydroquinone became grey haired after about four months when on a stock diet, but no other symptoms of vitamin deficiency appeared. The hair of these mice again turns black when their diet is supplemented by rice polishings concentrate. It is suggested that hydroquinone destroys the achromotrichia factor in the same manner as ferric chloride destroys vitamin E.

9. U. S. P. BIOASSAY REFERENCE STANDARDS FOR DIGITALIS. C. T. Ichniowski, Warner Institute for Therapeutic Research, New York City, New York.—The author discussed the subject of reference standards for U. S. P. digitalis and submitted experimental studies and comments that suggest the desirability of a change in the present standards.
10. SOME OBSERVATIONS ON THE BIOLOGICAL ESTIMATION OF ERGOMETRINE ACID MALEATE. Edwin J. deBeer and Paul A. Tuller, Burroughs Welcome and Company, Tuckahoe, New York.—The authors presented their observations on the biological estimation of ergometrine acid maleate.
11. THE EVALUATION OF A GROUP OF GERMICIDES BY AN EGG INJECTION TECHNIQUE. B. Witlin, Philadelphia College of Pharmacy, Philadelphia, Pennsylvania.—The author describes a technic for the valuation of germicides by injecting eggs containing an avian embryo. Minimum lethal doses were determined for a number of substances. A number known as the "toxicity index" was determined from a comparison of the bactericidal efficiency with *Staphylococcus aureus* against the toxicity of the germicide for chick-embryos.
12. BIOASSAY OF ANTHELMINTICS. J. C. Munch, J. D. McIntyre, and Z. J. Drozd, Temple University, Philadelphia, Pennsylvania.—The authors made a critical study of the methods of testing the potency of a large number of anthelmintic drugs on goldfish, worms and isolated tissues and determined the effective and lethal concentrations.
13. STUDIES ON VIBURNUM XI. BIOASSAY METHODS. J. C. Munch, and H. J. Pratt, Temple University, Philadelphia, Pennsylvania.—The authors proposed that viburnum be assayed by determining the depressor effect on anesthetized dogs and its neutralization with epinephrine as an improved method of bioassay. Potency may be expressed in terms of epinephrine neutralizing activity.
14. THE EFFECTIVENESS OF CERTAIN DRYING AGENTS ON THE MOISTURE CONTENT OF DIGITALIS. Donald P. Le-Galley, Philadelphia College of Pharmacy, Philadelphia, Pennsylvania.—The author reported experimental studies of drying agents used to reduce the moisture content of digitalis. He found that



silica gel was an effective agent that could be reactivated at 130°C. This agent might be used to keep any delinquent substance dry when enclosed in suitable tight containers.

R. E. Thompson gave a paper finding that two factors, temperature of storage and alcohol concentration have important effects on the rate of deterioration of tincture of digitalis as measured by the overnight frog method assay. The stability of tincture of digitalis would be significantly increased by using U. S. P. alcohol as menstruum and storing in a refrigerator below 5°C.

L. Karel reported preliminary results of a study of the acute toxicity of sulfanilamide in guinea pigs under different conditions of vitamin C nutrition.

The names of those who registered and their affiliations are as follows:

|                        |                           |                      |
|------------------------|---------------------------|----------------------|
| Ashkenaz, David M.     | John Wyeth & Bro.         | Philadelphia, Pa.    |
| Brillhardt, R. E.      | Rutgers University        | Newark, N. J.        |
| Cattell, McKeen        | Cornell University        | Ithaca, N. Y.        |
| Chapman, C. W.         | University of Maryland    | Baltimore, Md.       |
| Christensen, B. V.     | Ohio State University     | Columbus, Ohio       |
| Cook, E. Fullerton     | Philadelphia Coll. Phar.  | Philadelphia, Pa.    |
| Cwalina, G.E.          | Creighton University      | Omaha, Neb.          |
| deBeer, Edwin J.       | Wm. R. Warner, Co.        | N. Y. City, N. Y.    |
| Deno, R. A.            | Rutgers University        | Newark, N. J.        |
| Doushness, Wm. N.      | J. T. Baker Company       | Phillipsburg, N. J.  |
| Dunn, M. S.            | Philadelphia Coll. Phar.  | Philadelphia, Pa.    |
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| Fischelis, Robert P.   | New Jersey Bd. of Phar.   | Trenton, N. J.       |
| Gershenfeld, Louis     | Philadelphia Coll. Phar.  | Philadelphia, Pa.    |
| Hamlin, Kenneth E. Jr. | University of Maryland    | Baltimore, Md.       |
| Hansen, Lorenz         | Jefferson Med. College    | Philadelphia, Pa.    |
| Happich, Wm. F. Jr.    | Sharp and Dohme           | Philadelphia, Pa.    |
| Hartung, Walter H.     | University of Maryland    | Baltimore, Md.       |
| Hoch, J. Hampton       | Med. College of S. Car.   | Charlestown, S. Car. |
| Holland, Madeline O.   | Philadelphia Coll. Phar.  | Philadelphia, Pa.    |
| Hueper, W. C.          | Wm. Warner & Co.          | N. Y. City, N. Y.    |
| Hunsberger, Ambrose    | Philadelphia Coll. Phar.  | Philadelphia, Pa.    |
| Ibsen, Maxwell         | Philadelphia Coll. Phar.  | Philadelphia, Pa.    |
| Ichniowski, C. T.      | Wm. Warner & Co.          | N. Y. City, N. Y.    |
| Jenkins, Glenn L.      | University of Minnesota   | Minneapolis, Minn.   |
| Kahoe, Walter          | J. B. Lippincott Co.      | Philadelphia, Pa.    |
| Karel, Leonard         | University of Maryland    | Baltimore, Md.       |
| Kaufman, K. L.         | Medical College of Md.    | Richmond, Va.        |
| Kendig, H. Evert       | Temple University         | Philadelphia, Pa.    |
| Krantz, J. C. Jr.      | University of Maryland    | Baltimore, Md.       |
| LaQuer, F. O.          | Temple University         | Philadelphia, Pa.    |
| Lewallen, E. E.        | Philadelphia Coll. Phar.  | Philadelphia, Pa.    |
| Levin, Nathan          | University of Maryland    | Baltimore, Md.       |
| Lewis, Thomas          | S. B. Penick Company      | N. Y. City, N. Y.    |
| Lichtin, Aaron         | Retail Pharmacy           | Philadelphia, Pa.    |
| Little, Ernest         | Rutgers University        | Newark, N. J.        |

|                        |                          |                    |
|------------------------|--------------------------|--------------------|
| MacLaughlin, E. H.     | Philadelphia Coll. Phar. | Philadelphia, Pa.  |
| Martin, G. J.          | Wm. Warner & Co.         | N. Y. City, N. Y.  |
| Mathis, Paul A.        | Sharp and Dohme          | Philadelphia, Pa.  |
| McDonnell John N.      | Philadelphia Coll. Phar. | Philadelphia, Pa.  |
| McDonnell, Jos. F. Jr. | Board of Pharmacy Lab.   | Harrisburg, Pa.    |
| Miller, Charles S.     | Sharp and Dohme          | Philadelphia, Pa.  |
| Moore, Maurice L.      | Sharp and Dohme          | Philadelphia, Pa.  |
| Muldoon, Hugh C.       | Duquesne University      | Pittsburgh, Pa.    |
| Munch, James C.        | Temple University        | Philadelphia, Pa.  |
| Myers, C. N.           | Columbia University      | N. Y. City, N. Y.  |
| Nichols, Adley         | Philadelphia Coll. Phar. | Philadelphia, Pa.  |
| Osol, Arthur           | Philadelphia Coll. Phar. | Philadelphia, Pa.  |
| Phillips, Lillian M.   | J. C. Munch Laboratory   | Upper Darby, Pa.   |
| Pines, C. C.           | Philadelphia Coll. Phar. | Philadelphia, Pa.  |
| Pratt, Harvey J.       | J. C. Munch Laboratory   | Upper Darby, Pa.   |
| Raiziss, George W.     | Univ. of Pennsylvania    | Philadelphia, Pa.  |
| Rogers, Charles H.     | University of Minnesota  | Minneapolis, Minn. |
| Rosen, Harry           | Wyeth and Brothers       | Philadelphia, Pa.  |
| Ross, Samuel L.        | Hance Bros & White       | Philadelphia, Pa.  |
| Schaffer, Chas. F.     | National Drug Company    | Philadelphia, Pa.  |
| Schaeffel, Eugene      | Wyeth and Brothers       | Philadelphia, Pa.  |
| Snyder, R. K.          | Amer. Pharm. Lab.        | Washington, D. C.  |
| Sprague, James M.      | Sharp and Dohme          | Philadelphia, Pa.  |
| Sussman, I. R.         | Drug Tropics             | N. Y. City, N. Y.  |
| Thompson, R. E.        | University of Maryland   | Baltimore, Md.     |
| Tyson, Floyd T.        | Temple University        | Philadelphia, Pa.  |
| Watts, Nellie P.       | Western Reserve Uni.     | Cleveland, Ohio    |
| Wasserman, Fannie R.   | State Board of Health    | Trenton, N. J.     |
| Welch, A. D.           | Sharp and Dohme          | Philadelphia, Pa.  |
| Wilcox, P. W.          | Sharp and Dohme          | Philadelphia, Pa.  |
| Wilcox, W. D.          | Lea & Febiger            | Philadelphia, Pa.  |
| Witlin, Bernard        | Philadelphia Coll. Phar. | Philadelphia, Pa.  |
| Wood, Horatio C.       | Philadelphia Coll. Phar. | Philadelphia, Pa.  |

#### *A MEMORIAL TO DR. W. G. CROCKETT*

Shortly after the death of Dr. Crockett, Mr. Ralph J. Walker of Newport News, a former student of Dr. Crockett's, and Mr. Charles L. Guthrie, of Petersburg, both suggested that a suitable memorial should be established in memory of Dr. Crockett. Later the Richmond Retail Druggists' Association adopted a resolution recommending to the Virginia Pharmaceutical Association that steps be taken to establish such a memorial. They suggested that it be a dispensing laboratory at the Medical College of Virginia, to be known as the "W. G. Crockett Memorial Laboratory". It had long been Dr. Crockett's desire to establish a dispensing laboratory for junior students, distinct from the clinical dispensing laboratory in which only senior students work. He felt by so doing, students could be better trained in dispensing and he had gone so far as to draw plans for the laboratory. The cost of equipping the laboratory, as planned, will be approximately \$3000.

The Richmond Retail Druggists' Association has already by unanimous vote contributed \$500.00 to the fund. There are undoubtedly others outside of the state of Virginia that would like to contribute to this fund. Contributions can be sent to Mr. F. J. Britton, 3016 Moss Side Avenue, Richmond, who is chairman of the committee appointed by the Virginia Pharmaceutical Association to supervise the collection of funds.

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## New Books

THE ABRAHAM FLEXNER LECTURES ON OXIDATION, FERMENTATION, VITAMINS, HEALTH AND DISEASE by Albert V. Szent-Gyorgyi, M.D., Ph.D., (Cantab.) D.H.C., Prix Nobel, Professor of Medical and Organic Chemistry, University of Szeged. 1939. Series Number 6. 109 pages. The Williams & Wilkins Company. Price \$2.00.

It takes unusual ability to present clearly and understandingly the intricacies of biological oxidation; how H gives up its electron which travels to the  $O_2$  in the cell; which processes in the body involve oxidation and which fermentation; the simpler, but in principle similar oxidation systems of plants; and, finally, the relation of vitamins to health and disease, including the story of how the author discovered the chemical nature of vitamin C. The author not only has such ability, but attempts to answer in an interesting and philosophical manner various questions dealing with the "wisdom of the body" involved in the above bodily reactions. Though every student of biology and chemistry should benefit from reading these five lectures, the fullest value is reserved for those properly trained in physiology and biochemistry.

H. G. O. H.

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A TEXTBOOK OF PHYSIOLOGY by William H. Howell, Ph.D., M.D., Sc.D. 1940. Fourteenth edition. 117 pages. 330 illustrations. W. B. Saunders Company. Price \$7.50.

The present edition brings this well known book up to date insofar as is possible. Obviously, work on vitamins and glandular substances proceeds so rapidly that it becomes necessary to supplement most any text with literature from current periodicals. Despite the inclusion of new materials, the total number of pages is less than in the previous edition. The fourteenth edition is an improvement over the thirteenth edition. However, the addition of more well chosen illustrations and a glossary might increase the value of the book for the average student. The use of larger type under each illustration is a decided improvement. From the mass of conflicting literature the author has again produced a textbook in which the subject matter appears to be well balanced. The same cannot be said of all textbooks of physiology now available. This new edition, as in the case of previous ones, should be of greater value to students as a reference or class room text. Certainly the book should be included in every pharmacy and medical library.

C. L. W.

SYNOPSIS OF MATERIA MEDICA, TOXICOLOGY, AND PHARMACOLOGY by Forrest Ramon Davison, B.A., M.Sc., Ph.D., M.B., Assistant Professor of Pharmacology, School of Medicine, University of Arkansas, Little Rock. 1940. 633 pages. 45 illustrations, including 4 in color. C. V. Mosby Company. Price \$5.00.

By selecting only "commonly used drugs with established effectiveness", by omitting "highly specialized scientific details" and by using smaller print the author has presented the major features of the pharmacology of the accepted drugs in a handy volume. In spite of the compactness, the book discusses all the recent advances, and includes briefly the anatomy and physiology pertinent to the subject; a liberal, up-to-date bibliography is appended to each chapter. A number of excellent tracings and diagrams, mainly accredited to Jackson's Experimental Pharmacology, are included. A special feature is the numerous suitable prescriptions interspersed in the text-material. About eighty pages deal with basic principles of pharmacology, materia medica, prescription writing and toxicology.

H. G. O. H.

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CLINICAL PELLAGRA by Seale Harris, M.D., Professor Emeritus of Medicine, University of Alabama, Birmingham, and Seale Harris, Jr., M.D., Formerly Assistant Professor of Medicine, Vanderbilt University, Birmingham, with 9 collaborators distinguished in their respective fields, and Foreword by E. V. McCollum, Ph.D., Sc.D., LL.D., Professor of Biochemistry, School of Hygiene and Public Health, Johns Hopkins University. 1941. 494 pages. 66 illustrations. 4 plates in color. C. V. Mosby Company. Price \$7.00.

After a careful reading of the book one cannot find words to express the value of the treatise so well as those which Dr. McCollum uses in the foreword when he says—"The title hardly does justice to the book. It is a philosophic treatment of clinical and experimental data of many kinds, contributed by many able workers who have contributed to the development of our knowledge of the biochemistry of nutrition and of the biologic agencies which act in conjunction with malnutrition states to undermine and pervert physiologic functions of certain types. Nowhere else is so complete a history of investigations relating to pellagra, and the assembled quotations and comments make a fascinating story. Clinicians will be entertained and instructed by reading the views of their studious colleagues, which point out how, as the result of primary deficiencies, bodily conditions may through debility and derangement of function of the gastrointestinal tract and the liver become unable to utilize indispensable nutrients in an adequate dietary. The book is a distinct contribution in that it extends the deficiency disease viewpoints beyond simple chemical reasoning into the field of perverted physiologic function."

R. A. L.

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The making of the Index for Volume IV which is sent out with this issue represents the painstaking work of Secretary Zada M. Cooper. The entire credit for its production belongs to her.—Editor.

## INSTITUTIONS HOLDING MEMBERSHIP IN THE ASSOCIATION

### NEW YORK

University of Buffalo, School of Pharmacy, Buffalo; A. B. Lamm, Dean (1937).

Columbia University, College of Pharmacy of the City of New York, New York; Charles W. Ballard, Dean (1939).

Syracuse University, College of Pharmacy, New York; James H. Miller, Dean (1938).

Santa Island University, Brooklyn College of Pharmacy, Brooklyn; Hugo M. Schneider, Dean (1939).

### NORTH CAROLINA

University of North Carolina, School of Pharmacy, Chapel Hill; J. Grover Bond, Dean (1917).

### NORTH DAKOTA

North Dakota Agricultural College, School of Pharmacy, Fargo; William F. Smith, Dean, (1922).

### OHIO

Ohio Northern University, College of Pharmacy, Ada; Rudolph M. Smith, Dean (1938).

Ohio State University, College of Pharmacy, Columbus; E. V. Christensen, Dean (1939).

Western Reserve University, School of Pharmacy, Cleveland; Edward B. Day, Acting Dean (1932).

### OKLAHOMA

University of Oklahoma, School of Pharmacy, Norman; David E. R. Johnson, Dean (1935).

### OREGON

Oregon State College, School of Pharmacy, Corvallis; Adolph Kiehn, Dean (1913).

North Pacific College of Oregon, School of Pharmacy, Portland; Antonio G. Mikolich, Dean (1914).

### PENNSYLVANIA

Duquesne University, School of Pharmacy, Pittsburgh; Hugh C. McJannet, Dean (1937).

Philadelphia College of Pharmacy and Science, Philadelphia; Ivar Griffith, Dean (1935).

Temple University, School of Pharmacy, Philadelphia; H. Evert Keadle, Dean (1932).

University of Pittsburgh, Pittsburgh College of Pharmacy, Pittsburgh; G. Leonard O'Connell, Dean (1939).

### PENNSYLVANIA

University of the Philippines, College of Pharmacy, Manila; Mariano V. del Rosario, Dean (1917).

### Puerto Rico

University of Puerto Rico, College of Pharmacy, Rio Piedras; Luis Torres-San, Dean (1939).

### RHODE ISLAND

Rhode Island College of Pharmacy and Allied Sciences, Providence; W. Henry Edward, Dean (1934).

### SOUTH CAROLINA

Medical College of the State of South Carolina, Charleston; Robert Wilson, Dean; School of Pharmacy, Washington M. Seigler, Director (1940).

University of South Carolina, School of Pharmacy, Columbia; Henry T. Motley, Dean (1938).

### SOUTH DAKOTA

South Dakota State College, Division of Pharmacy, Brookings; Floyd J. Lullman, Acting Dean (1937).

### TENNESSEE

University of Tennessee, School of Pharmacy, Memphis; Robert L. Crowe, Dean (1914).

### TEXAS

University of Texas, College of Pharmacy, Austin; William F. Gilley, Dean (1934).

### VIRGINIA

Medical College of Virginia, School of Pharmacy, Richmond; Worley F. Ridd, Dean (1932).

### WASHINGTON

University of Washington, College of Pharmacy, Seattle; Forest J. Goodrich, Dean (1932).

State College of Washington, School of Pharmacy, Pullman; P. H. Strobel, Dean (1932).

### WEST VIRGINIA

West Virginia University, College of Pharmacy, Morgantown; J. Lester Harrison, Director (1930).

### WISCONSIN

University of Wisconsin, School of Pharmacy, Madison; Arthur H. Uhl, Dean (1936).

## THE AMERICAN COUNCIL ON EDUCATION AND ITS WORK

No individual can hope to be efficient in the field of professional education unless he keeps in touch with what is going on in the field of education on all levels. For that reason we are listing here the publications of the Council which should be in every pharmacy library and familiar to all pharmaceutical educators.

**THE HEALTH OF COLLEGE STUDENTS** by Harold S. Dietz and John E. Shepard.—A story of the health problems of 4,000 students and of 500 institutions of higher learning.

**EDUCATIONAL OPPORTUNITY FOR YOUTH** by Newton Edgerton.—Describing the unequal distribution of educational opportunities within the states and provides a collection and analysis of the growing demand for federal aid for the equalization of the educational program.

**THE NEGRO YOUTH IN STORY AND FACT** by Ira D. Smith.—The problem of pharmaceutical education of the Negro youth. Includes the background information in the form of a bibliography.

**THE HISTORY AND ACTIVITIES OF THE AMERICAN COUNCIL ON EDUCATION**—This is the general brochure which describes the organization, history, organization, committees and activities.

**THE NEGRO YOUTH IN STORY AND FACT** by Howard M. Bell.—The findings of the National Commission on Guidance and Placement carried on by the United States Employment Service in six communities.

**THE STUDENT PERSONNEL WORK** by Esther Lloyd.—The study of the Committee on Student Personnel Work in the field of student personnel work broadly conceived for the purpose of guiding, advising, students and activities.

**COMPARATIVE COMMISSIONS REPORTS ON SECONDARY EDUCATION: THE AMERICAN EXPERIMENT**—Prepared by the Educational Policy Commission for the Council's Committee on Implementation of the National Secondary Education.—This report summarizes the findings of the major educational pronouncements for the past several years.

**THE AMERICAN YOUTH AND AMERICAN POLICY** by Blake Cochran.—A series of motion pictures of immediate interest to the youth of the world crisis should be of especial interest to the youth in the social studies, administrators and visual education.

**THE AMERICAN YOUTH AND AMERICAN POLICY** by Blake Cochran.—The official quarterly publication of the Council. All the Council's publications may be obtained for a list of prices by addressing 744 Jackson Place, Washington, D. C.